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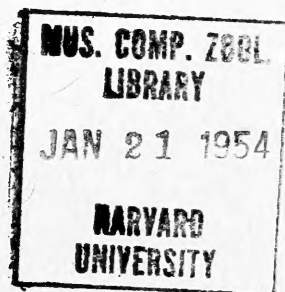


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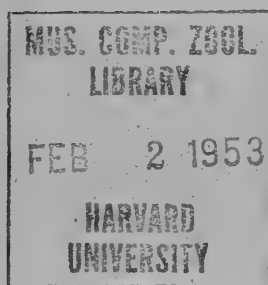
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'Black' Larvae of *Lasiocampa quercus* L. in Yorkshire

By FRANK HEWSON, F.R.E.S.

Members of the Bradford Naturalists' Society were extremely interested in Dr. E. A. Cockayne's article upon *Lasiocampa quercus* L. (*Ent. Rec.*, 64, 306-9) for the f. *callunae* is often abundant on the nearby Rombalds Moor. Our first record of a dark larva occurred on 9th July 1900, when Mr. B. Illingworth reported that he had found a black larva on the moor. No further mention of this one occurs.

In early August 1944 a junior member, George Flett, brought me twenty-four larvae which he had found on the moor, asking if I would look after them whilst he was on holiday. Two of these were a very dark brown, almost black, and they spun up on 7th and 19th August. One died, but the other produced a male *olivaceo-fasciata* on 18th June 1945.

In 1946 a newly-elected junior member, J. T. Willans, told me that in 1944 he had found a number of larvae of this species on the moor and that one of these was very dark brown, almost black, but unfortunately he failed to rear it.

On 7th September 1946 I collected a number of larvae from heather at St. Ives, Bingley, and noted that some were darker in colour than normal, *though not so dark as those previously mentioned*. On 11th June 1947 I found in my puparium a female which was intermediate in colour between that of the male and female, and a burst cocoon spun by one of these dark larvae. On 16th June a female *olivaceo-fasciata* emerged. (See *The Naturalist*, 1948, p. 37.) The two above-mentioned *olivaceo-fasciata* are in the Cartwright Memorial Hall Museum, Lister Park, Bradford.

On 24th June 1950 Mr. J. Briggs found a black larva amongst others on the moor (and informed me that one shown to him three days previously, by a boy, had been taken a mile away from his). Mr. Briggs very carefully kept the one separate and found that the cocoon was dark, pointing out that probably this is because of the dark hairs which were woven in. Much to his disappointment in 1951 a normal male *callunae* emerged.

In 1950 Mr. C. R. Haxby also collected about fifty normally-coloured larvae in various instars, but later discovered that two of them were then "black". (In my experience they are never really black, but a dark nigger brown.) Eventually he had five of these but could not discover at which moult they assumed the darker colouration, because of the mixture of stadia. Four of the imagines which emerged in 1951 were darker than normal, and one of a batch of cocoons which he sent to a correspondent at York produced a female *olivaceo-fasciata*. The

latter was exhibited at the Y.N.U. Entomological Section meeting at Leeds on 29th March 1952.

From the above reports two further queries emerge, have others noted a larval moult from the normal colour to the dark, and is the silk of the dark cocoons darker than normal, or are they so solely because of the darker hairs woven in?

The only other published record known to me upon "black" larvae in Yorkshire appears in *The Naturalist* for 1926. Page 21 reports that at the Annual Meeting of the Entomological Section of the Y.N.U. on 17th October 1925 Mr. B. Morley exhibited *callunae*, long series of peculiar dark-grey females, the males also darker, bred from black larvae, from Penistone Moors, whilst on page 55 the Annual Report for 1925 states that "Black larvae of *Bombyx* var. *callunae* from Penistone Moors produced males slightly darker than ordinary, and females of a dark smoky brown without a trace of the yellow colour".

New Aberrations of *Arctia caja* L.

By S. GORDON SMITH, F.L.S., F.R.E.S.

PLATES I AND II.

Ab. *paucimacula* ab. nov. (Fig. 1).

Forewings. Ground colour warm buff, markings dark brown and except for the discocellular stigma mark, mainly peripheral.

Hindwings. Ground colour yellowish buff heavily dusted with pinkish orange, markings black normal. Thorax dark brown with pinkish orange collar, abdomen a mixture of pinkish orange and yellowish buff.

Type ♀ : Chester, bred 1952.

EXPLANATION OF PLATE I.

Fig. 1. *Arctia caja* ab. *paucimacula*, ♀. Type.

Fig. 2. *Arctia caja* ab. *rubrociliata*, ♀. Type.

Fig. 3. *Arctia caja* ab. *septa*, ♂. Type.

Fig. 4. *Arctia caja* ab. *schizomacula*, ♀. Type.

Fig. 5. *Arctia caja* ab. *quadricothurnata*, ♀. Type.

Fig. 6. *Arctia caja* ab. *albistagnata*, ♂. Type.

Ab. *rubrociliata* ab. nov. (Fig. 2).

Forewings. Ground colour pale cream, markings blackish brown. The scales of the forewing fringes are reddish-orange with the exception of a few which are blackish brown.

Type ♀ : Chester, bred second generation 1951.

Ab. *septata* ab. nov. (Fig. 3).

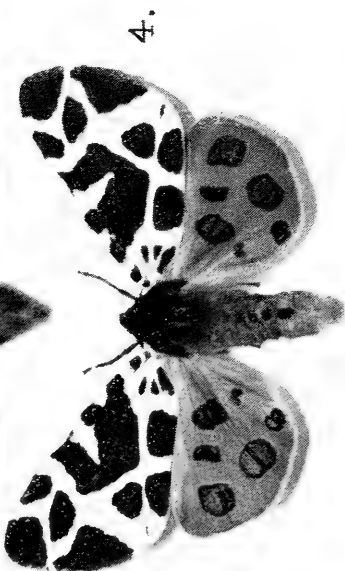
Forewings. The outermost component of the triple costal mark is separated from the other two components by a band of white ground colour.

Type ♂ : Chester, bred 1952.

Ab. *schizomacula* ab. nov. (Fig. 4).

Forewings. The boot-shaped mark on the costa of the subterminal band is divided into two marks and the cottage loaf-shaped mark on the inner margin of the same band is also similarly divided.

Type ♀ : Chester, bred 1952.



1.

3.

5.



Ab. quadricothurnata ab. nov. (Fig. 5).

Forewings. The triple costal mark is divided into three sections which are approximately boot-shaped, the subterminal mark on the costa is also boot-shaped.

Type ♂ : Chester, bred second generation 1951.

Ab. albisignata ab. nov. (Fig. 6).

Forewings. The three components of the triple costal mark are completely fused, forming a solid brown mark on the costa; near the centre of this is a white mark shaped like a comma which does not touch the costa.

Type ♂ : bred from a Formby wild larva 1921.

All the above have been bred by myself and are in my collection.

PLATE II.

Ab. bijuncta ab. nov. (Fig. 1).

Forewings. The innermost component of the triple costal mark is joined just beyond the middle to the median component in addition to the normal connection.

Hindwings. The base, most of the costal and the inner and outer marginal areas are reddish-orange; the normal markings are black joined together by a black suffusion.

Type ♀ : Chester, bred second generation 1951.

EXPLANATION OF PLATE II.

Fig. 1. *Arctia caja* ab. *bijuncta*, ♀. Type.

Fig. 2. *Arctia caja* ab. *nigromarginaria*, ♂. Type.

Fig. 3. *Arctia caja* ab. *obliterata*, ♀. Type.

Fig. 4. *Arctia caja* ab. *nigrovenosa*, ♂. Type.

Fig. 5. *Arctia caja* ab. *quadricothurnata*, ♂. Type.

Fig. 6. *Arctia caja* ab. *fusata*, ♂. Type.

Ab. nigromarginaria ab. nov. (Fig. 2).

Forewings. The costa, outer and inner margins are blackish-brown, this colour extending in various widths, narrow along part of the costa but broad along the outer margin where the sub-terminal and terminal bands are united.

Hindwings. The outer row of spots is joined to a black outer border. Fringes greyish-brown.

Type ♂ : Chester, bred 1952.

Ab. obliterata ab. nov. (Fig. 3).

Forewings. Ground colour cream, markings normal.

Hindwings. Ground colour reddish-orange, there is a heavy black suffusion from near the base which obliterates the discoidal and costal spots and extends about half-way across the wings, reaching the first two spots of the outer margin but not touching the two near the anal angle.

Type ♀ : Chester, bred 1952.

Ab. nigrovenosa ab. nov. (Fig. 4).

The veins of the forewings are black or blackish.

Type ♂ : Chester, bred 1952.

Ab. nubilata ab nov. (Fig. 5).

Forewings. A smoky suffusion extends asymmetrically across the wings and darkens the white ground colour and lightens the blackish-brown markings where it covers them.

Hindwings. The spots of the outer row are indistinct owing to a blackish suffusion.

Type ♂: Chester, bred second generation 1951.

Ab. fusata ab. nov. (Fig. 6).

Forewings. The innermost and median portions of the triple costal mark are fused, the quadrate mark on the inner margin is represented by a small almost round black spot.

Type ♂: Chester, bred third generation 1952.

All the above have been bred by myself and are in my collection.

Notes on Breeding *Cycnia mendica* Clerck

By L. J. EVANS.

I was beating for larvae at West Malvern in May 1949 when a ♀ *Cycnia mendica* Cl. fell into the beating tray. Being in need of a series of this insect I decided to keep the moth for eggs. On closer examination I noticed the markings were slightly larger than usual. These were nine in number compared with the seven of other specimens I had seen, including those illustrated on plate 75 of South's *Moths*, Vol. I.

Obligingly she began laying before I arrived home, and by the next day had laid over one hundred eggs. These hatched ten days later and the larvae were fed on dead-nettle (*Lamium album*).

Seventy reached the last instar, and all had spun cocoons by 26th July 1949. Only forty pupae were perfectly formed. I kept these in a shed in the garden, and was surprised to find a newly emerged ♀ in the cage on 12th November 1949. Six weeks later a ♂ emerged followed by another ♀ a week afterwards. No more emerged until late April (1950) when between the 30th of that month and the 11th May full emergence took place. 8 ♂♂, 12 ♀♀.

There was nothing really striking about the F1 generation, although all ♀♀ but one showed a marked tendency towards larger and more numerous spots, and two ♂♂ had fawn thoraxes instead of the usual sooty brown. Two ♀♀ were the form ab. *lineata*. Several pairings were attempted, in two of which the same ♂ (C) was used successfully. (This was necessitated by a shortage of ♂♂ when required). I made seven pairings, six of which occurred after midnight, the other pair mated during the day. All ♀♀ laid eggs which began to hatch on the 21st May 1950, 21 days after they were laid. Four broods were kept. The larvae were fed as before on dead-nettle which was readily accepted, and on 29th June 1950 the first one pupated, nearly four weeks earlier than the previous generation. This led me to think that I might expect emergence the same year, but this was not so, for the first F2 moth appeared in the cages on 15th May 1951, and the rest during the following three weeks. Four moths emerged from Brood AB/50, thirty-three from CJ/50, and thirty-three from CD/50. The fourth brood (about 10 pupae) failed. The third moth to emerge had a creamy-white ground colour; the forewings had a slightly smoky appearance near the

apex, and there were six spots. The costa and fringe were black. The hindwings had eight black spots, and only traces of black on the fringe. This insect compares favourably with the illustration of *ab. nigrociliatā*, Fig. 7, Plate VIII, in Vol. 63 (page 262), of *The Entomologist's Record*.

It was four days before a ♂ of the same brood emerged, this being the usual dark brown colour, with eight black spots on each of the forewings, and six nearly obscure spots on the hindwings. The two were immediately placed in the same box. A week after placing them together about a half-dozen eggs were seen on the sides of the box, but these proved to be infertile. I tried changing the ♂ without success. Hoping to keep the strain going, further attempts at pairing others of the same and different broods were tried. In all I kept sixteen pairs. Four of the ♀♀ laid eggs, but only one batch was fertile. These were from the only pair seen *in copula*.

Oviposition continued over a period of two weeks, in which time 138 eggs were laid. Forty-three larvae hatched, sixty-six died in the egg, and twenty-eight eggs remained unchanged, presumably infertile. The larvae grew very slowly, and there were frequent losses. When half-grown, and about two dozen in number, I took them with me on my summer holiday, further deaths occurred during this time. Finally the remainder, about ten, were found to be dead when I arrived home. This must have been due to their confined quarters, and the stifling heat on the long return journey.

From observations made during the rearing of this strain, I suggest it was not a favourable one for inbreeding. Delayed emergence (this could have been caused by the prolonged wet winter of 1950-51). High percentage deformity in F2 moths. (Deformity nil in F1, 13% in F2). Refusal of F2 ♂♂ to pair. Females were capable of attracting ♂♂ as was proved when I found a ? wild (or escape) ♂ in the garden flying round the muslin covered cage containing an F2 ♂ and ♀.

The variation in the strain was probably multifactorial, and as there was no clear-cut segregation, I divided the broods by comparing the number and size of the spots with those of the P1 female.

		No. of moths with markings similar to P1 ♀.	No. of moths with more or heavier markings than P1 ♀.
F1	♂♂	9	0
	♀♀	6	8 (including 2 <i>ab. lineata</i>)
F2	♂♂	9	6 (including 1 <i>ab. lineata</i>)
Brood CD	♀♀	5	13 (including 1 <i>ab. nigrociliata</i> and 3 <i>ab. lineata</i>)
F2	♂♂	14 (including 1 Fawn Col.)	3 (including 1 <i>ab. lineata</i>)
Brood CJ	♀♀	13	3

From the numbers given in the above table, it would appear that the factor controlling the size and number of spots is carried by the female.

Description of Parents of Broods CD and CJ.

- ♂ C—8 spots on forewings
5 spots on hindwings } Same size as spots on P1 ♀.
- ♀ D—8 spots on forewings
7 spots on hindwings } Larger than spots on P1 ♀.
- Traces of black on fringes.
- ♀ J—6 spots on forewings
6 spots on hindwings } Slightly smaller than spots on P1 ♀.
- Traces of black on fringes.

In his "Aberrations of British Arctiidae", *Ent. Record*, Vol. 63, p. 262, Dr. Cockayne does not mention the ♂ of *ab. lineata*. I bred two ♂♂ of this form in the F2 generation. If this is the first record of it, I shall be more than pleased with my little experiment.

73 Warren Hill Road, Birmingham, 23.

Further Notes on *Mompha nodicolella* Fuchs

By S. WAKELY.

Since my last notes on *Mompha nodicolella* (*Entom. Record*, 1951, 63, 274-5) this species has been found locally common in two districts in Surrey, so another chapter of its life history can be written.

Larval galls were first found on 18th May 1952, at Ockham Common on *Epilobium angustifolium*. I was collecting in this district with Mr. L. T. Ford on this date and he spotted a gall as we were passing plants of Rosebay. This was at least six weeks earlier than expected, and on searching the plants we found the galls were comparatively common. Moths emerged from these larvae during the first fortnight in June.

On 2nd June I was at Mickleham Down (Headley Lane slope) and found the galled stems of the Rosebay even more common than at Ockham. A number of these showed exit holes made by the larvae when full fed and seeking pupation quarters elsewhere, but plenty of tenanted galls were obtainable. Two galls on the same stem were not uncommon, and occasionally a stem with as many as three galls was found. It seems probable that where more than one gall to a stem was found, different moths were responsible, as one gall was usually tenanted and the other empty. The larva completes its growth in a single gall.

Corrugated paper seems to suit the larvae admirably for pupation purposes, and it was noticed that the white spun silk cocoon is of a sticky nature and inclined to adhere to one's fingers if removed from the paper.

From the dates given one must conclude that the species is continuous brooded from mid-May to the end of August, as tenanted galls have been found from 18th May right up to the 2nd September.

Lepidoptera Collecting Notes, 1952

By NEVILLE L. BIRKETT, M.B.

The year under review has provided a great mixture of weather. In general the spring was early, and fairly good conditions prevailed until the middle of July after which the climate can only be considered as bad. That conditions in the early part of the year were remarkable was demonstrated by the great migratory influx of early March. In

the Kendal District this was noted mainly with respect to those two common migrant micros, *Plutella maculipennis* and *Nomophila noctuella*. A no-longer-active entomologist reported having seen a *Plusia gamma* at this time and I received the observation with considerable scepticism until, having heard of the strange events in the south, the occurrence became quite plausible.

My m.v. trap has been operated in my garden on suitable nights and during the year I have added over thirty species to my total for the trap. My total taken in the centre of Kendal is now over 260 species.

By the end of March many of the commoner species were in evidence—*Phigalia pedaria*, *Anisopteryx aescularia*, *Erannis marginaria*, *E. leucophaearia*, *Theria rupicaprararia* and *Larentia multistrigaria* had all been noted in or about Kendal.

After the warmth of the early part of March the cold weather which set in about the middle of the month felt like the return of winter and it was difficult to believe that such species as *Plusia ni* and other rather exotic creatures had been about in the land. In my diary under 13th March I note: "Easterly air stream, cloudy and cold. Trap operated for over an hour and there wasn't even a midge in evidence". And I might note that Trichoceridae and Chironomidae are plentiful in my garden. This cold weather persisted for the next few weeks and was to be with us at the end of the month when I went to Scotland.

On the 16th in sunshine on the local mosses *Brephos parthenias* was flying plentifully, but on the birch trunks there was no sign of *Achlya flavicornis*. The latter species usually is to be found commonly on the first really sunny day of spring sitting on the birch trees where it is visible from a distance of at least twenty yards. I did take a specimen of *flavicornis* in my trap on 21st March and the same night the first *Xylocampa areola* occurred.

Up in Aviemore Mr. Philip Harwood had been keeping an eye open for the appearance of *Brachionycha nubeculosa* and on 3rd April I received word from him that he had found a specimen. I contacted Mr. Reid and in company with John Thorpe of Kendal we went north on the 4th. En route we stopped at Struan and found that the railway posts were abundantly occupied by fresh *Poecilopsis lapponaria* and goodly series were obtained. A single *Panolis flammea* was also found newly emerged.

We spent four enjoyable days at Aviemore and though conditions were far from good we managed in that time to take about ten *B. nubeculosa* between us. Only one of these was obtained at the m.v. light which we operated on our first night only. The nights were frosty and insects were not flying at night. Fertile female moths were obtained and these produced batches of eggs from which in due course many larvae hatched. The larvae resulting fed up well on birch, and acceptable alternative foodplants noted were apple and willow. These alternatives were temporary expedients only and no attempt was made to rear the species on either of these. The larvae having got almost full-fed, and hopes being high, proceeded to perish miserably from some plague unknown. The first sign of the malign influence was that the tail end of a larva became a dirty pale green and had a slightly shrivelled appearance. This colouring and the shrivelling spread headwards so that in a couple of days a fine upstanding and handsome caterpillar was

transformed to a flabby, insipid deflated corpse! I lost over fifty larvae in this way without being able to determine the reason for their demise. As they looked shrivelled I tried spraying the foodplant with water and on first doing this I noted that the larvae seemed grateful and were actually to be seen drinking. But it was to no purpose and all perished. The pundits of course recommend sleeving for this species, but it is difficult to see exactly why there should be such a great difference and equally difficult to explain why all the deaths occurred only in the final instar. Other insects at Aviemore included an abundance of the very attractive Highland form of *flavicornis*, *multistrigaria* and sundry *Orthosias*.

Back to Kendal for the Easter week-end I joined a party of members of the Raven Entomological Society for their Good Friday trip to the Witherslack Woods. Some eighteen species were recorded at both fallow and light. *Gypsites leucographa* proved plentiful on the willows, and numerous specimens of the more common and widespread *Orthosias* were noted. An early *Selenia bilunaria* was obtained and a single *Nothopteryx polycommata* was found on an ash trunk. The latter species was to become plentiful in the next week. Another species commoner than usual this spring was *Orthosia miniosa* which was plentiful in the woods and also came to my m.v. trap in Kendal itself. On the 13th April at Witherslack a single *Chaonia ruficornis* was taken early in the evening. This species seems to fly quite early and on the night in question was about the first moth to come to my lights.

Another early emergence was noted on the 18th when a fine fresh specimen of *Spilosoma lutea* was taken in the Winster valley—the earliest date I have in the records is 12th May 1937. I was close by a stream in Winster when an *Orthosia munda* fell into it and I was interested to see it fluttering on its back and making good progress in the water until it came to a suitable foothold, climbed out and flew away none the worse. The same night in my trap I had over 250 specimens and over 20 species—remarkably good for the early date.

A single specimen of *Odontesia carmelita* in my trap on 19th April was a welcome record (vide *Entom.*, LXXXV, p. 190).

During the early part of May I had little time for field work and observations are few. By the middle of the month both *Saturnia pavonia* and *Thecla rubi* were well out on the local moorlands. On 16th May I visited Brigsteer Wood in S. Westmorland and found *Bapta bimaculata* to be very much more common than I have ever seen it before. I also got a specimen of *Peronea literana*—a most attractive green Tortrix which has not been seen in the area for many years. The same night at Kendal the trap gave over 40 species including a nice dark form of *Apatele alni*, two *Selenia lunaria* and a single *Drepana binaria*. The last seems to be a well established species in the district and comes regularly though singly to light in Kendal. What spare time I had at the end of May was spent in fruitless search for habitats suitable for *Amathes alpicola*. Though areas where the foodplant was plentiful were found there was no sign of either larvae or pupae of this desirable insect. My search was prompted by the finding in the Lake District by Mr. F. T. Vallins of a specimen of the moth two years earlier. I was not looking in the same area as he had worked but was hoping to find the species in another area well away from his locality.

The first fortnight of June I was on holiday and for the first part of it I revisited Tenby in Pembrokeshire where I had been so successful the year before. This visit coincided with a spell of poor weather so that very little collecting was done. The second week of June I was in the Dorking area and here conditions were much more propitious and I took some interesting insects. Using a sheet illuminated by a 125 Watt m.v. lamp I noted over 70 species on 9th June which included *Sphinx ligustri*, *Deilephila elpenor*, *D. porcellus*, *Drymonia dodonaea*, *Tethea ocularis*, *Horisme vitalbata* and *Euphyia cucullata*. On the 11th I joined Dr. de Worms at Tilgate and in spite of cool clear conditions we took a number of *Tethea fluctuosa* and also two worn *Hapalotis venustula*. It was the first time I have visited that locality and I was duly interested in the possibilities it presents. On 12th June a visit to Box Hill and to Ranmore was disappointing. At the former locality in spite of fine sunny conditions I saw hardly a butterfly and the only moths were a few common Crambids. At Ranmore conditions were also good but insects scarce. I was pleased to take a few *Pararge aegeria* but saw no other butterflies. The sheet gave a host of insects on the night of the 13th which included *Stauropus fagi*, *Arctia villica* and *Comibaena pustulata*. This part of my holiday gave me a number of species which were new to me and which I was requiring. To the collector used to the south most of the species will of course be commonplace.

I returned to Kendal on 16th June and the weather for the next fortnight was very bad, but the end of the month saw ideal conditions for collecting at light. On the night of 29th-30th June I took over 50 species in my trap and this was the 'best ever'. However, this record was not to stand for long because on the night of 1st-2nd July over 70 species were taken and the total number of moths in the trap must have been nearly two thousand. Nothing very unusual was taken and the best insect was *Pyrria umbra* which is scarce in the Kendal district though said to be frequent at Grange-over-Sands.

Collecting at Hutton Roof on the carboniferous limestone of S. Westmorland with the Rev. J. Vine Hall we were surprised to take a fine fresh *Plusia bractea* on 5th July. This species in the next week or two became quite common both there and also at Kendal. On 7th July I visited the local moorlands and took a nice series of *Lygris populata*. About one specimen in ten was almost unicolorous smoky brown with ill defined markings. In contrast the type specimens were a finely marked lot especially in the males.

During July another fruitless search was undertaken, this time visiting old haunts of the f. *masseyi* of *Lycaena aegon*. The moss-lands of S. Westmorland are drying up considerably as a result of extensive drainage operations in the surrounding fields so that these wonderful habitats are changing rapidly and not for the better so far as concerns the field naturalist. While no sign of this butterfly was noted I like to think that absence of evidence is not evidence of absence. On the margins of the mosses *Argynnis cydippe* was very plentiful.

August provided some shocking weather and it seemed as if the season was over. Towards the end of the month Mr. Reid came to stay and we visited a fen area of North Lancashire in search of *Celaena leucostigma* which we found much less commonly than it had been the pre-

vious year. We also took a single *Arenostola phragmitidis* which has not previously been taken nearer than Warrington to the best of my knowledge. This species must be studied next year to determine its status. On the same night, 23rd August, a specimen of *Actebia praecox* was taken in my trap. There is a record of a specimen of this being taken in Kendal in 1899 and there are a few records for the Grange area, but the nearest known locality is on Walney Island some forty miles away.

I visited the Lleyn for the second part of my holiday in September. I was again rather unlucky with the weather, there being a very bright moon the first week and the second week produced a cold and persistent northerly air stream. Insects were few indeed and I only noted about forty species during the whole fortnight.

Back in Kendal the latter part of the month gave a good number of *Cirrhia gilyago* in my trap so that it appears as if the species is much commoner in the district than has hitherto been suspected. More specimens were taken this year than comprise all the previous records.

Collecting came to an end at the end of September though a few of the commoner autumn species were noted either at house lights or in the car lights. The trap was scarcely operated because of the poor conditions. On the whole the season has not been a good one and did not live up to its early promise.

Kendal, 6th Nov. 1952.

Some Northern Lepidoptera in 1952

By Major-General G. F. JOHNSON, C.B.

The following is an account of Lepidoptera collected in North Cumberland and various parts of Scotland during week-ends and short holidays in 1952.

The season may be said to have started when a number of pupae of *Endromis versicolora* L. collected as larvae at Aviemore in 1950 began to emerge, after lying over two winters, towards the end of January. They had been brought indoors early in the month. Some pupae containing the red form of *Orthosia gracilis* Schf., taken as larvae on bog myrtle in Appin the previous summer, began to emerge at the end of February.

The first trip to Aviemore, on 29th-31st March, produced, in very cold weather, five *Brachionycha nubeculosa* Esp. at rest on birch trunks. Of these two were crippled females. One promptly died but the other, confined in a small breeding-cage with perforated zinc sides and supplied with birch twigs and a pad of cottonwool soaked with sugar solution, produced some 350 eggs between 1st and 8th April. A few eggs were deposited on twigs but most of them on the outside of the perforated zinc, the ovipositor being pushed through the perforations. They began to hatch on 30th April. The larvae were kept through the first instar in glass tumblers closed by old quarter-plate glass camera plates. Some were reared up to the pupating stage in these tumblers with no difficulty, care being taken to avoid overcrowding and fresh food being given daily. In the last instar not more than two or three larvae were allowed in any one glass. It was found that on occasional oak leaf was appreciated as a variation from birch. After

the first instar the bulk of the larvae were sleeved out on growing birch. All larvae went down to pupate in large flowerpots filled with a mixture of peat and sand by 5th July. There appeared to be no casualties from disease though some escaped or were killed from mechanical causes, including drowning in the first instar in condensation on the inside of their glass tumblers. There were, however, about 40% casualties after the larvae had gone down in their flowerpots. The cause was not apparent, larvae either failing to pupate or drying up and becoming mouldy. Possibly the trouble was due to the earlier larvae being disturbed by subsequent arrivals before pupating or before pupae had hardened. Some 25 larvae were allowed to go down in each pot, which may have been too many. Sixty healthy pupae have been stored in tins for the winter, and one flowerpot in which 25 larvae have gone down has been left undisturbed.

In North Cumberland a moth-trap with m.v. lamp was worked for twenty-two nights between 9th April and 11th May. The most interesting moths included one *Odontesia carmelita* Esp. on 1st May, one *Orthosia miniosa* Schf. on 18th April (possibly a new county record), one *O. opima* Hüb. (*advena* Schf.) on 14th April, and ten *Drymonia ruficornis* Hufn., including 2 females, between 13th April and 11th May.

The appearance of *O. carmelita* at the trap led to a search of the nearest birchwood, about a mile away. This produced six *carmelita* including three females at rest on the birch trunks. The only previous county records seem to have been from the Lake District.

On 30th April near the same locality over 30 cocoons of *Aegeria culiciformis* L. were cut out of birch stumps (felled in the winter of 1950/51) where the larvae had been located the previous August. Many of the cocoons were parasitized, but besides ichneumon flies some 12 moths emerged between 23rd May and 9th June. A web of *Euphydryas aurinia* Rott. larvae was found near this same locality (four miles from Brampton, Cumberland) on 15th April.

A trip to the Fort William district on 17th-18th May produced ten freshly-emerged *Hydriomena ruberata* Fr., one *Cleora cinctaria* Schf., one *Notodonta ziczac* L., one *Anagoga pulveraria* L. and many *Apatele menyanthidis* View. from posts on the Fort William-Spean Bridge road. Returning by Struan on 18th May one fresh *Tethea or* Schf. and one *C. cinctaria* were found on railway posts.

On 19th and 20th May five *Hadena bombycina* Hufn. (*glauca* Hüb.) and a few *Epirrhoe tristata* L. were taken at rest on a moorland fence near the Edinburgh-Lanark road. On 23rd May one *Carterocephalus palaemon* Pall. and a few *H. ruberata* were taken in the Fort William district.

The Whitsun week-end, 30th May-2nd June, at Aviemore with Baron de Worms was not very productive owing to bad weather and a good deal of rain. Larvae of *Thera cognata* Thun. were common on juniper; a few *H. bombycina* (*glauca*), *Hadena contigua* and *Hadena nana* Hufn. (*dentina* Esp.) were found on posts; but a visit to the high ground west of Aviemore only produced four pupae of *Amathes alpicola* Zett., two each.

On 14th June sugar on a fence in marshy ground at the head of Loch Tay at Killin produced three *Apamea unanimitis* Hüb. (not a com-

mon moth in Scotland). The night was cold or no doubt more would have been obtained. The following day on the lower slopes of Ben Lawers at about 2,000 feet near the Killin-Glen Lyon road *Erebia epiphron* Kn. was flying, a very early date; *E. tristata* was abundant in the same locality.

The week-end of 4th-6th July was again spent at Aviemore. *Eurois occulta* L. was numerous at sugar on 4th July on the golf course fence. The two following nights were poor, but melancholy thistles in flower on the banks of the Spey and east of Aviemore station produced two *Plusia bractea* Schf. and one ♀ *Gnophos myrtillata* Thun., early dates for both species. On 6th July, a hot day, *Plusia interrogationis* L. was flying in some numbers on Granish moor and a series was easily secured during the afternoon.

The m.v. trap in North Cumberland was worked for eleven nights in July. The night of 25th July was remarkable, producing 1824 moths of 88 species (excluding micros). This represented about one-third of the year's total catch of individuals in this trap. 1037 of the moths were *Tripbaena pronuba* L.! The more interesting species, with numbers, caught during the month were as follows:—11 *P. bractea*, 19 *Lampra fimbriata* Schreb. (*fimbria* L.), 3 *Celaena leucostigma* Hüb., 1 *Nudaria mundana* L., 2 *Apamea ophiogramma* Esp., 1 *Anaplectoides prasina* Schf. (*herbida* Hüb.), 1 *Comacla senex* Hüb., 64 *Euproctis similis* Fues., 5 *Pheosia tremula* Cl., 8 *Abrostola triplasia* L., 1 *Eustrotia uncula* Cl., 1 *Perizoma bifaciata* Haw., 3 *Venusia cambrica* Curt., 9 *Chloroclystis coronata* Hüb., 2 *Orthonama lignata* Hüb., 2 *Carsia paludata* Thun. *A. ophiogramma* on 26th and 30th July and *C. senex* on 26th July are new county records.

On 13th July sugar on some old willows on the banks of the River Irthing near Brampton produced many *Apamea ypsilon* Schf. (*fissipuncta* Haw.).

On 20th July a daytime visit to Rannoch only produced one worn *Itama brunneata* Thun. from the Black Wood and one *Perizoma minorata* Tr. from beside the Kinloch Rannoch-Aberfeldy road.

The night of 1st August was spent at Dalwhinnie. Sugar was useless, a mile of fence across the moors producing some three moths of common species (*Apamea monoglypha* Hufn. and *Amathes xanthographa* Schf.) and no signs of *Apamea exulis* Lef. (*assimilis* Dbl.). A Crookes glass m.v. lamp in the hotel bedroom produced two of the dark Scottish form of *Trichiura crataegi* L. and a few worn *Xanthorhoe munitata* Hüb. but little else of interest. Next day two *P. minorata* and one *Perizoma blandiata* Schf. were obtained at rest on posts on a heath bordering the Spey at Aviemore. The same night, though it was cool and unfavourable, on the Findhorn sandhills two fresh *Euxoa cursoria* Hufn. were found on heather and three *G. myrtillata* came to a petrol lamp. On 3rd August, though it was too wet to beat, 23 small larvae of *Harpyia furcula* Cl. were found on small willows in a hollow in the Culbin Sands. Many larvae of *Cerura vinula* L., *N. ziczac*, *Laothoe populi* L. and *Colocasia coryli* L. were also noticed. Sugar that night on the edge of the Sands only produced a few *Parastichtis suspecta* Hüb. On 4th August, a better day, a number of the fine local form of *Satyrus semele* L. were taken on the Culbin Sands and, curiously late, one *Uhesius rufata* Fab. in good condition. That

night in a wood near Forres six *Amathes depuncta* L., freshly emerged, came to sugar at dusk. Later one *Actebia praecox* L., four *E. cursoria* and three *G. myrtillata* were taken on the Findhorn sandhills on heather.

A further visit to Forres and Aviemore was paid the next weekend, 8th-10th August. On 8th August twelve *A. depuncta* came to sugar in the same wood at Forres. That night the Findhorn sandhills produced one *A. praecox* and one black *Triphaena comes* Hüb. on heather with two *G. myrtillata* at light. On 9th August sugar along the inner edge of an area of old birch trees on the northern edge of the Culbin Sands produced two fresh *Enargia paleacea* Esp. and one *Diarisia dahlii* Hüb. Heavy rain put a stop to operations by 11 p.m. On 10th August sugar was tried on the Golf Course fence at Aviemore and six *E. paleacea*, one *Lithomoia solidaginis* Hüb., some *D. dahlii* and other common insects appeared. Another collector obtained one *A. exulis* from the same fence.

The m.v. trap in North Cumberland was worked for eleven nights in August and nine in September. The more interesting captures included 11 *L. fimbriata*, 3 *Gortyna flavago* Schf., 4 *Cirrhia gilvago* Schf., 4 *C. leucostigma*, 3 *Aporophyla nigra* Haw., 2 *Hydraecia petasitis* Dbl., 3 *E. similis*, and 1 *Nonagria typhae* Thun.

It was an early season with many favourable nights in July, particularly for light. Sugar was not generally very productive and the numbers of moths on heather on the Findhorn sandhills were disappointing. September was a very poor month with low night temperatures and persistent northerly winds.

Field Notes

We hear a good deal every year about the doings of lepidopterists among the macrolepidoptera of the Scottish Highlands but very little, if anything, of their doings among the 'micros'. Has anybody during this last fifty years made a search for the Pyralid *Titanio phrygialis* Hüb. which was reported to have been taken by Charles Turner in Scotland some time during last century? It was in 1892 that the following Note appeared in *The Entomologist's Monthly Magazine*, (28: 264):—

Hercyna phrygialis Hb. probably a British Insect.—While on a visit last autumn to the Rev. A. Matthews of Gumley I saw in his collection a moth of which he related this history. Many years ago, as Turner was returning from one of his collecting tours in Scotland, and called at Gumley with his captures on his way up to London, Mr. Matthews picked this specimen out as a Pyralid new to him. On taking the specimen to the Natural History Museum, Mr. Warren at once pronounced it to be a common Alpine species—*Hercyna phrygialis* Hb. I may add that, at the first glance, it bears a superficial resemblance to *Psodos coracina*, and it might possibly be passed over as that species. As to its origin, while there is nothing unlikely in the capture of this species among the Scotch mountains, Turner was always considered trustworthy in his statements as to habitat, and apparently he neither knew nor put any particular value on this specimen, so that I consider

the probabilities to be in favour of the supposition that it was taken in Scotland.—PHILIP B. MASON, Burton-on-Trent. September 12th, 1892.

To this the Editors of the *E.M.M.* appended this Note:—"We commend the above to the notice of Scotch Lepidopterists. We think no one ever doubted the honesty of Turner; the possible chance of error is that he may have received the insect from an intermediate source. Although abundant in the Alps, it occurs also on the mountains of Scandinavia"

Charles Turner was a professional collector and a first rate field naturalist who added a dozen new species to the British list. At his death in 1868 Frederick Smith wrote an obituary of him in which he said: "Of collectors Turner was perhaps in every way the one whose loss will be most felt by entomologists. . . . No one I have known could so perseveringly, and usually so successfully, carry out investigations aided simply by a few hints and suggestions. He had a most accurate eye; the form of an insect once submitted to him as a species of rarity, and therefore worth his searching for, seemed to be indelibly impressed upon his memory". (*Entomologist*, 4: 107).

Lhomme (*Cat. des Lép. de France et de Belgique*, No. 2088) says that *T. phrygialis* is a mountain species in France and gives a long list of localities. He remarks of the larva that it is polyphagous and is easily found under stones, occurring in August and September, but he gives no description of it, and Spuler states that it is unknown. Through the kindness of Mons. S. Le Marchand of Paris, however, who in response to our request has visited the Musée Nationale d'Histoire Naturelle for the purpose, we have received the following description made from inflated skins in the Chrétien Collection:—

"Larva of a pale dirty flesh pink with five darker and redder longitudinal lines; one dorsal, two sub-dorsal and two supraspiracular; head chestnut brown, lightly marbled with darker brown, prothoracic plate reddish-testaceous; dots variegated brownish black, each emitting a long black hair, tapering to a fine point; legs concolorous, the thoracic pairs being ringed blackish at the joints."

It might be worth the while of some of our field workers in the Highlands to investigate. Turner's specimen may have been the last survivor of an indigenous race which has died out through amelioration of climate; on the other hand *T. phrygialis* may still linger in unworked snow-line localities in Scotland. The moth is on the wing from May to July.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Tortricodes tortricella Hüb. (*hyemana* Hüb.). If hot sunny weather occurs at the end of January or beginning of February this moth may be found in most woodlands. The male flies in the sunshine pretty freely at midday; the female can be beaten out, when she usually flutters slowly to the ground, but is easy enough to take. *T. tortricella* prefers young oaks or oak scrub and seems partial to those which retain the old dead leaves till the spring. It has a very long emergence period, as is to be expected in so early an insect. I have taken it perfect from January till the end of March.

The capture of *Ancylolomia tentaculella* Hüb. at Dymchurch by Canon Edwards and Mr. Wakely draws attention to what a revolution in our knowledge of Microlepidoptera the m.v. lamp is likely to cause. We may expect other new species. Many, the majority indeed, of the Crambids have curiously secretive habits, a very short flight time, and no desire to visit sugar. Who would ever expect to take *fascinellus*, *contaminellus* or *salinellus* by day or, except for twenty minutes at dusk, at any time without a light? Yet these are all common enough in their special localities and I have no doubt those species of which there are only one or two recorded examples would have been taken much more freely had the m.v. lamp been possible.

Chilo cicatricellus Hüb., regarded as a fraud or doubtful by most collectors, has been confirmed by Mr. Chalmers-Hunt. I do not think Harding's captures of *poliellus* and *lithargyrellus* a hundred years ago have ever been doubted, but I am convinced these moths have occurred more frequently and been overlooked. After all, when a lot of Crambi are buzzing around in the evening the odds are against the rare one being spotted, but if he is fool enough to drop on a sheet or enter a trap his chance of escape is pretty small.

On the subject of immigrants, it seems curious to me how in some cases these seem to come in cycles. To take an example, the lovely *Margaronia unionalis*, to my mind the most beautiful of all our Pyralids. When Barrett wrote his account of it at some time in the last few years of the nineteenth century (I am referring to the date of writing, not publication) the undoubted British examples could be checked off on the finger-ends. For the next forty years it was almost equally rare. Yet now it seems to be taken comparatively freely. I am aware, of course, that a number of these captures have occurred at the m.v. lamp, but the moth has also been taken at Buddleia flowers, on fences, at ordinary lights in houses (my friend Dennis Smith looked up in his bath and saw one sitting on the bathroom wall!) and in several ways that were equally available in 1900.

On the other hand *repandalis* and *polygonalis* seem to have dropped out altogether. Seventy or eighty years ago they would have been classed with *unionalis*. Farn had a *polygonalis* of whose genuineness he was certain, and the moth swarms in the Mediterranean, but it does not appear to have been particularly adventurous lately. One would have expected it to come over with *sacraria*.

Notes and Observations

INCIDENCE OF *EUPITHECIA INSIGNIATA* HÜB. (CONSIGNATA BORK.).—Has this species become more common of recent years? According to Hutchinson's List of the Lepidoptera of Herefordshire published by the Woolhope Field Club many years ago *E. insigniata* was taken at Grantsfield circa 1866 but was not taken apparently between then and 1889, when the last revised summary was issued. I took four specimens here at Moccas this last year (1952).—R. BENNETT SISSON, Moccas Rectory, Hereford. 14.xi.52.

[I took it in Montgomeryshire in 1942, and since it has been recorded from many counties (see Barrett, 9: 35) it is probably widespread and

not uncommon but is rarely taken because its bionomics are obscure.—P.B.M.A.]

INCIDENCE OF *ANTHOCARIS CARDAMINES* L. IN 1952.—In a year remarkably poor for butterflies in my district the Orange-tip was unusually common. It was noted in many places well removed from its usual haunts, and in early June eggs were found on plants of Lady's Smock (*Cardamine pratensis*) growing on the moors at 1,000 feet above sea-level.—T. D. FEARNEHOUGH, 13 Salisbury Road, Dronfield, Derbyshire.

HADENA CAESIA SCHIFFERMÜLLER IN CUMBERLAND.—There are four specimens of *H. caesia* Schiff. labelled "Cumberland. 1899, S. Walwyn" in the National Museum of Wales, Cardiff. Dr. Matheson, Keeper of Zoology, tells me they are in the collection formed by Henry Wyndham Vivian of Port Talbot, and presented to the old Cardiff City Museum in 1902. Probably S. Walwyn is H. W. Shepheard-Walwyn, who was collecting at that date, and there seems to be no reason to reject the record, but I have never heard of any other English specimens. I hope collectors in that region will try to confirm it. Since *caesia* is now known to occur in Canna and Rhum in the Inner Hebrides, it would not be surprising to find it on the English coast opposite the Isle of Man.—Ed.

A DOUBTFUL RECORD OF *CATOCALA ELECTA* BORKHAUSEN.—In the *Field*, 1952, 4th October, p. 548, Mr. A. H. Gomme (misspelt Gommer) reported the capture of a scarce red underwing, *Catocala electa* Borkh. at Long Crendon, near Aylesbury, Bucks. As he admitted he had a very limited knowledge of Lepidoptera, I wrote and asked him to let me see the moth and make sure his identification was correct. He said that he had put the moth into a box before going to Italy and on his return the box could not be found. It is probable that the moth was *Catocala nupta* Linn. and this record of *electa* should be disregarded unless it is confirmed.—Ed.

DAY-FLYING HABIT OF *AMMOGROTIS LUCERNEA* LINNAEUS.—During July 1951 one day collecting on the south coast of the Isle of Man I noticed several moths in fast zigzag flight along the cliff at about 3.30 B.S.T. I endeavoured to catch one but missed each time as it passed. This year I tried again and they were flying as before, now and then hovering at a certain spot as if there might be a female present, and then continuing their flight. The position was rather precipitous, but I managed at last to net one as it flew past, and it proved to be *Ammogrotis lucerneae* Linn.—ALFRED HEDGES, Ballavale, Santon, Isle of Man.

LARVAE OF *LASIOCAMPA QUERCUS* L. EATING SEEDS OF IVY.—I have some larvae of *Lasiocampa quercus* L. from eggs laid early last August. They have been kept in a living-room and fed on ivy, and are all in their final skin, some being almost ready to spin up. To my surprise I have noticed them feeding on the hard seeds of the ivy flower, consuming the whole seed. In fact, the seed seemed to be preferred to the leaf, but this may have been due to the larva's habit of climbing to the top of the ivy stems, where of course the seeds are. Has this liking for the seed been noticed before?—R. M. MERE, Mill House, Chiddingfold, Surrey. 23.xi.52.

LEUCANIA LYTHARGYRIA ESPER AB. *NIGRESCENS* AB. NOV.—Forewing—deep red-brown overlaid with smoky colour, darker and duller at the base and marginal area, external to the row of black dots, discoidal spot white, fringe with inner half pale and outer half dark brown. Hindwing—blackish brown. Head, thorax, and abdomen blackish brown. Under side—forewing uniform blackish brown with no silvery shimmer; hindwing blackish brown with two pale streaks running from the base, but not quite reaching the margin. the first through the cell, the second between nervures 1 and 2; discoidal spot pale, lying partly in front of first streak.

Type ♀: At light. Weybridge, Surrey, vii.1951, A. A. Best.
—A. A. BEST, 131 Woodham Lane, New Haw, Weybridge, Surrey.

ABERRATIONS OF *ARCTIA VILICA* LINN.—With reference to Dr. Cockayne's interesting paper on this subject in the *Record*, 64: 301-5, my own small experience may be of interest. In 1901 as a schoolboy I began to rear *vilica* and kept on doing so until 1908, the whole of my larvae being taken wild from the Gravesend district and nearly all from one road just outside the town. The first moth to emerge, on 5th June 1901, was a magnificent female *ursula*, and from that day to this I have never seen another *ursula* alive. In view of the fact that apart from Dr. Kettlewell's there are only three female *ursula* at Tring—this was indeed 'beginners's luck', especially as I only bred one other *vilica* that year.

In 1903 I bred about ten ab. *confluens*. In those days I kept only one row of an insect the size of *vilica*, so I gave away or exchanged all of these but three. These three are all males, so I fancy the rest were too, as had one been a female I should almost certainly have kept it. As a boy, not having heard of Romanoff, I called this ab. "The Old Man's Face Variety" and if the confluent spots of the termen are looked at with that name in view it will be seen they present some resemblance to the countenance of an aged bearded chawbacon as represented on the music hall stage. The aberration in which the two upper apical spots alone are confluent I called the "Fox-Head".

All my three remaining *confluens* are asymmetrical, one having the right side as in Fig. 5 "Trans. ad ab. *bruyanti* ♂" in Dr. Cockayne's plate, the left being *confluens*. I only saw *confluens* in 1903; in all I suppose I bred about 300 *vilica* from this locality.—H. C. HUGGINS, 65 Eastwood Boulevard, Westcliff-on-Sea. 15.xi.52.

A TALL STORY.—Recent numbers of the *Record* have contained several references to Mr. E. F. Johns of Winchester, in connection with the capture in former days of *Carterocephalus palaemon* Pall. in Hampshire. I met Mr. Johns only once, and that was thirty years ago, but I shall never forget him, for he told me the tallest entomological story that has yet reached my ears. I had gone to see Mr. Johns on business, and after a while the conversation turned to entomology. Mr. Johns told me that he did much of his collecting in Crab Wood, a few miles from Winchester, and that he had permission from the owner, Sir George Cooper, to go there whenever he wished. In those days I had never taken *Apatura iris* L. and was particularly anxious to do so. I asked him if it occurred in Crab Wood, and he said that he had once taken a *larva* there at sugar and that from this he had bred a female *iris* which, with-

out pairing, had laid a batch of fertile eggs. I do not remember whether he mentioned the species of tree on which the larva was found. It would be quite possible to sugar an ancient willow trunk, and *iris* larvae are often found on very old trees. Moreover, I have on several occasions watched an *iris* larva absorb a drop of rain-water on a willow leaf, after the manner of *Philudoria potatoria* L. This particular larva was apparently not a teetotaller. One has heard of eggs laid by *Lasiocampa quercus* L. and allied species occasionally proving fertile without mating having occurred; but I have never yet found anybody willing to believe this reported instance of parthenogenesis in *Apatura iris*. I make no comment except to say that Mr. Johns was perfectly serious about the whole matter and that as he was a stranger to me it seemed rather unlikely that he was pulling my leg.—H. SYMES, 52 Lowther Road, Bournemouth. 27.x.52.

PARARGE AEGERIA L. AT FLOWERS.—This species is only rarely seen at flowers and, in most cases, feeding does not take place. However, on 23rd August 1952 in Darenth Wood, Kent, A. J. Showler and I observed a male feeding from a flower of golden rod (*Solidago virgaurea*). On 16th May 1952 one was seen at a flower of a hawthorn bush (*Crataegus monogyna*) at Wytham, Berkshire, but did not feed. In the autumn of 1952 at Wytham small numbers of *aegeria* were seen at ripe blackberries (*Rubus* sp.), but it is not known to what extent they fed from the juice of this fruit. Further unpublished records would be gratefully received and acknowledged by the writer.—D. F. OWEN, Edward Grey Institute of Field Ornithology, Oxford. 22.xi.52.

LEPIDOPTERA IN TIT NEST BOXES IN FEBRUARY.—During February 1952 an examination of about two hundred nest boxes placed on tree trunks in a piece of mixed deciduous woodland at Wytham, Berkshire, revealed the following lepidoptera. One *Nymphalis io*, hibernating, three cocoons of *Dasychira pudibunda*, one pupa of *Bena prasinana*, egg-mass and cocoon of one *Orgyia antiqua*, four pupae in cocoons of *Caradrinidae* sp. (possibly *Apatele psi*) and considerable numbers of empty pupae of *Tortrix viridana*. Moths found dead included *Eupsilia transversa* (3), *Conistra vaccinii* (1), *Amphipyra pyramidea* (4), *Operophtera brumata* (1) and a number unidentified. In addition, several live hornets *Vespa crabro* were found in the boxes, a situation in which they often nest in the early summer. The above records suggest that in addition to creating artificial holes for nesting titmice (*Parus*) we have provided crevices similar to the normal hibernating and pupating sites of certain insects.—D. F. OWEN, Edward Grey Institute of Field Ornithology, Oxford. 22.xi.52.

GREY SQUIRREL ATTEMPTING TO CATCH TRIPHAENA PRONUBA L.—On 26th June 1952 at Wytham, Berkshire, I observed a Grey Squirrel (*Sciurus carolinensis*) chase and attempt to catch a Yellow Underwing moth (*Triphaena pronuba*). The attack lasted some seconds, the moth fluttering about on the ground, before eventually making its escape. The squirrel was shot immediately afterwards, but the stomach contained vegetable matter only. This might indicate that the mammal was not at the time making any special search for moths. Although a record such as this is of little importance since it contains only one

isolated observation, it is of interest since predation by vertebrates on large adult lepidoptera seems to be rarely seen, though it must occur regularly.—D. F. OWEN, Edward Grey Institute of Field Ornithology, Oxford. 22.xi.52.

ABNORMAL LARVA OF *PTEROSTOMA PALPINA* CLERCK.—In mid-June 1951 I collected a number of eggs of *P. palpina* from aspen on Dartford Heath. All produced normal larvae except one which hatched on 23rd June. This larva was of normal colour except for the presence of a bright red tubercle in the same position as that in *Lophopteryx capucina* L. (*camelina* L.) which on examination with a lens proved to consist of two tubercles in tandem, not side by side as in *L. capucina*. They were definitely part of the cuticle and not red mites, pollen grains, etc. Unfortunately they vanished with the first moult, and the larva then became perfectly normal, ultimately producing a normal *P. palpina*.—H. M. DARLOW. 27.xi.52.

CALLOPHRYS RUBI L., A NEW FOODPLANT.—In the spring of 1951 I observed this species commonly on both sides of the Darent valley between Lullingstone and Shoreham in Kent. It was on the wing in profusion in localities from which the more usual foodplants were absent. On the 8th July in a field below 'The Birches' I followed several very worn females fluttering low over the chalk vegetation and frequently settling amongst the grasses, but was unable to discover what attracted them. On the 22nd July I found a possible solution to the mystery in a similar field below 'The Polhill Arms', where I found a full grown larva inside a flower head of Mouse-ear Hawkweed, *Hieracium pilosella*, which it had hollowed out. It continued to feed on this pabulum for three days before pupating. I can find no other record of this species feeding on Compositae.—H. M. DARLOW. 27.xi.52.

VANESSA CARDUI L. AND NYMPHALIS IO L. IN THE NORTH-WEST KENT MARSHES.—In view of the interest shown in the unusually early immigration of *V. cardui*, the following account of the status of the species this year on the Thames marshes between Dartford and Greenhithe may be worth recording.

At Dartford Marshes on 25th May I watched two females ovipositing on thistles growing along the river-wall. In the same place on 8th June several *cardui* were to be seen, including three or four very fresh examples. Several more were present elsewhere on the fresh marsh. By the end of the month they were much more common and on 29th June great numbers were swarming along the river-walls and on the fresh marshes. Most of them were very worn. On my next visit, 17th August, I noted only a few worn specimens, also two *Colias croceus* Fourc.

On the afternoon of 19th April I was much impressed by the exceptional numbers of *N. io* flying about the Dartford and Stone Marshes, over 100 being seen in the course of a six-mile walk.—J. F. BURTON, 43 Eversley Road, London, S.E.7. 16.xi.52.

CRAMBUS CONTAMINELLUS Hb.: A SURREY LOCALITY.—On 25th July 1952 I took a specimen of *Crambus contaminellus* Hb. near St. Martha's Church, Chilworth. As far as I know this is a new locality for this

very local species. It was flushed while walking across a grassy stretch on the ascent to the Church. It was very lucky I marked the exact spot where it settled, and it had to be extracted with difficulty from the base of the grass stalks and made no effort to fly again. This species is difficult to disturb during daylight, but flies freely at dusk.—S. WAKELY, 26 Finsen Road, Ruskin Park, London, S.E.5. 5.xi.52.

STRIDULATION IN *LAPHYGMA EXIGUA* HÜB. AND *AGROTIS SEGETUM* SCHF.—Whilst collecting at light in Sardinia in September 1949 I took a specimen of *L. exigua* which on circling the lamp gave vent to two loud cracking clicks. The sound was similar to the preliminary clicks produced by the Arctiid *Euprepia pudica* Esp. when about to commence its well-known stridulation. I have heard bats produce similar, though quieter, clicks, but in this instance neither bats nor *pudica* were present, the light being on board ship a mile off the beach.

In June 1951 I took a female *A. segetum* flying low over a bed of thrift at Bexleyheath. Just before it was netted it produced a low purring not unlike that of a large beetle. The noise continued for three or four seconds whilst the insect was in flight, and I do not think that it was produced by the vibration of the moth's wings against the flower heads.—H. M. DARLOW. 27.xi.52.

ARCTIA CAJA L.: AN OUTSIZE SPECIMEN.—From a larva of *A. caja* found at Kennington, South London, a very large female was bred on 13th June 1952. It has a wing expanse of 80 mm., which is about 5 mm. more than its normal range. The specimen is a slight var., with the white markings on the forewings broader than usual, and anterior black spots on hindwings tending to form a bar.—S. WAKELY, 26 Finsen Road, Ruskin Park, London, S.E.5. 5.xi.52.

A SPRING MOVEMENT OF HUMBLE BEES ON THE KENT/SUSSEX COAST.—On 13th April 1952 I found a westerly movement of Humble Bees in progress along the coast between Dungeness and Camber. Two species were participating, *Bombus lapidarius* L. and *B. lucorum* L., particularly the former. Between 1300 hours and 1500 hours G.M.T. I saw some 50 or 60 flying due west. They flew singly and with a strong, purposeful flight, never pausing, between 5 and 25 feet above ground-level. Two ornithologists also remarked on the movement independently. It was a very fine and sunny day with a cloudless sky and practically no wind, what little wind there was being from the east. The next day, which was also very fine, but with a fresh easterly breeze, I found no evidence of the continuation of the movement.—J. F. BURTON, 43 Eversley Road, London, S.E.7. 16.xi.52.

THE LARVAE OF *LEUCANIA PUDORINA* HÜBN.—During early spring 1951, when searching for night-feeding larvae near Doncaster, I found three individuals of the 'wainscot type' amongst a much larger number of *Amathes xanthographa* larvae. All three were feeding on *Dactylis glomerata*, and in captivity they seemed to prefer this to other species of grass. Subsequent examination of these larvae revealed a strong likeness to those of *Leucania lithargyria*, although I had none of the latter to compare, but their ground colour seemed paler and less inclined

to be tinted with pink. The larvae all pupated successfully, and early in July three examples of *Leucania pudorina* emerged. As I had not previously reared this moth I was encouraged to make a further search for larvae in the spring of 1952. The weather was not very favourable for night larvae hunting on the three occasions when I made the attempt, but a number of the desired species were taken. Incidentally, the larvae of *Amathes xanthographa* were in very reduced numbers compared with the previous year, and the same remark applies to other common species. Examples of the *Leucania pudorina* larvae were sent to Messrs. H. E. Hammond and G. Haggett, and the latter mentioned that he had not previously been able to separate this species from *Leucania lithargyria* in the larval stage. Both species have three whitish, dark-edged lines down the back, and each also has a double row of blackish lines which are distinctly heavier towards the rear. South mentions *Phragmites* as being the food-plant of *Leucania pudorina*, but the larvae probably feed on several grasses that grow in damp localities. Several of those found in 1952 were on grasses other than *D. glomerata*.—GEORGE E. HYDE, F.R.E.S., 20 Woodhouse Road, Doncaster, Yorks. 28.xi.52.

THIRD BROOD OF *PHEOSIA TREMULA* CLERCK.—In August last I took a female *Pheosia tremula* Cl. at light and she obligingly laid a few eggs in the chip box. These duly hatched and the larvae fed up rapidly on sallow, but the rate of mortality was high and only two of the larvae reached their final instar. They pupated on 20th October and to my surprise two female moths emerged last Sunday, 16th November. They are both of a much greyer appearance than usual and considerably smaller. One has a wing span of 45 mm. and the other 43 mm.—F. J. STONE, 79 Reedley Road, Westbury-on-Trym, Bristol. 21.xi.52.

LYCIA HIRTARIA CLERCK IN FOLKESTONE.—During last April some twenty males of this species were taken in Folkestone, Kent. I have no previous record of its occurrence in this district; it does not appear in Messrs Embry and Youden's Dover-Deal list; and the first mentioned in Dr. Scott's Ashford list was taken in 1950. The Folkestone specimens are not like those I have from London. They are more heavily marked and their ground colour is greyer. One is tempted to suppose that they have worked their way here not from North Kent but from somewhere in Sussex.—A. M. MORLEY, 9 Radnor Park West, Folkestone. 26.xi.52.

POLYOMMATUS ICARUS ROTT. AB. CAECA.—The 'Common Blue' was once again very scarce in 1952. I could find only a few females of the spring brood and not one with any sign of variation. I therefore obtained eggs from a normal female and bred a small batch through. Imagine my surprise when the last imago to emerge turned out to be a very advanced obsolete male form. Except for two or three tiny spots the underside is devoid of markings and almost the form *caeca*. I obtained a pairing from earlier emergences and have larvae of this F2 generation now hibernating. It will be interesting if any further obsolete forms appear in this or subsequent generations.—R. C. DYSON, 112 Hollingbury Park Avenue, Brighton, 6. 27.xi.52.

BLOCKS VERSUS BOARDS.—I was so pleased to see your article in the *Record* as I have always been a firm supporter of the block setting method and lisle thread as opposed to the long boards. The enclosed sketch may interest you as I think it gets rid of the one possible objection to the block method, *i.e.* travelling with insects set on them. I have set in this case in a moving car and have travelled from Aldershot to Cornwall by way of Northumberland without any damage to the insects, provided that all the tails of the insects are hanging downwards when the setting-case is closed and stood on its hinged side.

To get any particular insect out before the rest are dry, drop the hinged side; press the bottom setting-block in the required row towards the open drop-side until the bottom setting-block is free. My slats slide easily enough for this. In turn remove the blocks by sliding them down to the bottom of the row until you reach the insect you want. Remove it and replace the empty block and the full ones. Press the outer slat (next to the drop-side) away from the hinged drop-side, raise the drop-side, and close the case.

EXPLANATION OF DIAGRAM.

- Fig. 1. End view of Travelling Setting Case. On the right some of the setting blocks have been removed to show the slats. d.f.=hinged drop flap with v.=perforated zinc ventilator. sl.=slat, g.sl.=cam-shaped groove into which the slat fits.
- Fig. 2 and Fig. 3. Inside views of inner and outer walls of the case showing the slat fitting into a plain slot and into a slot with a cam-shaped groove respectively.
- Fig. 4. Side view of Setting Case, with both drop-flaps, d.f., down. In the upper half of the case a slat is shown moved up to the top of its groove to enable the normal setting blocks, n.b., adjacent to it to be slid down and free of the slat for removal. One of the tongued blocks, t.b., and several of the normal blocks in another row have been removed to show the slats.
- In the lower half of the case the row of tongued blocks is shown, with the grooved drop-flap which will lock them into position when the flap is closed.
- Fig. 5. End view of the drop-flap, showing the groove, gr., which engages with the tongue of the tongued blocks, and the flange, fl., by which the other half of the case locks the drop-flap when closed.
- Fig. 6. View of a normal setting block, showing the slots cut in each side, s., and the cork, c.
- Fig. 7. View of a tongued setting block. The tongue, t., fits into the groove, gr of Fig. 5.
- Fig. 8. Oblique view of one slat, showing the rounded ends. The slat is $\frac{1}{8}$ of an inch thick.
-

This travelling case was made for long setting-boards. I converted it for use with blocks kept in position by slats fitting into grooves in the sides of the blocks. One end of the slat fits into a slot; the other slides down a cam-shaped groove into its slot. When the hinged drop-side is raised the blocks are firmly fixed, and closing the case keeps the drop-sides from opening. Always insert the blocks so that the insects are upright when the drop-side is to your left.—COLONEL S. H. KERSHAW, Alderman's Place, Aspley Heath, Bletchley, Bucks. 5.viii.52.

BLOCKS VERSUS BOARDS.—There is a point, and it is an important one, in connection with "pulling" the wool off the block which should be mentioned. In order to effect this it is essential that *all* the edges of the block be sandpapered, with fine sandpaper, until they are not

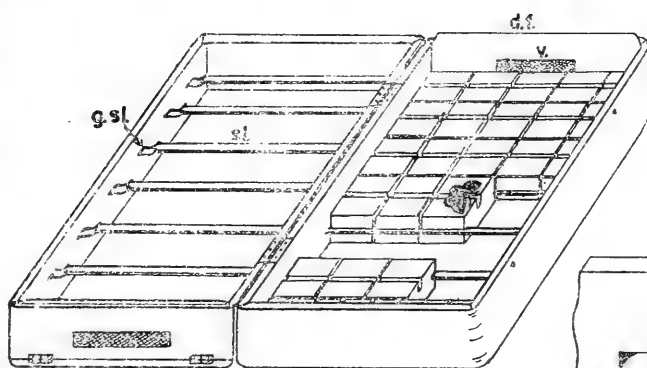


Fig. 1

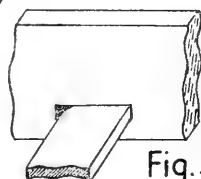


Fig. 2

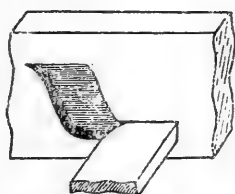


Fig. 3

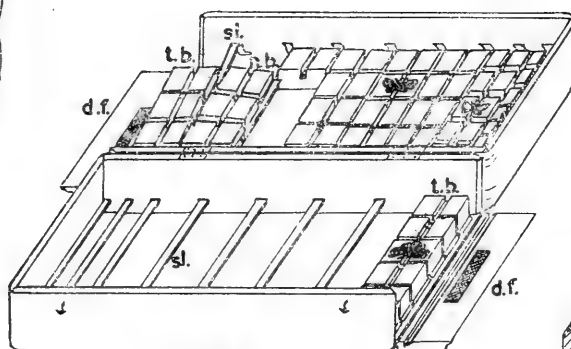


Fig. 4

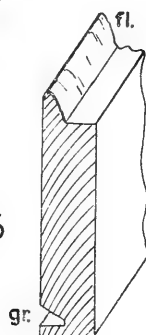


Fig. 5

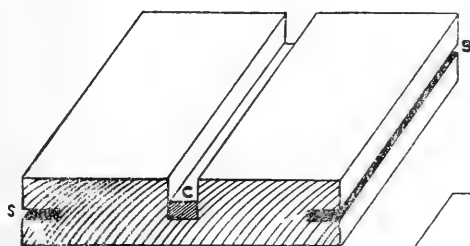


Fig. 6

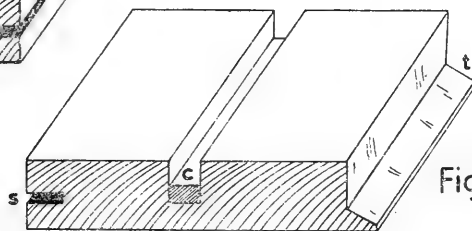
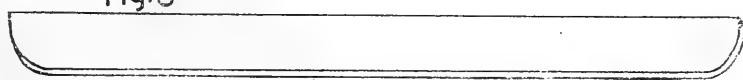


Fig. 7

Fig. 8



only perfectly smooth but slightly rounded. The wool then slides off quite easily. I think this process of sliding the wool off is also helped by the very slight camber which I give to my blocks when making them (see Plate IX of Vol. 64).—O. M. H.

LARVAE OF LIMENITIS CAMILLA L. AFFECTED BY PARASITES.—On the 18th April 1952 I collected about 16 young larvae of *Limenitis camilla* in a Huntingdonshire wood. The majority were on low-growing honeysuckle, and were not more than a foot above the ground. In spite of the mild weather at the time, and the advanced state of the honeysuckle leaves, about half of these larvae were still in their hibernating quarters. The rest varied slightly in size, but none had reached the third moult. My main purpose in taking the larvae was to obtain photographs of their various stages, and for a time all seemed well. They displayed no sign of ill health until after the fourth moult, when their behaviour became more lethargic and their feeding spasmodic. The first one to mature pupated successfully, but another unfortunately lost its grip and fell when making the change. This one subsequently produced a male imago with the L.H. forewing slightly crippled, and its more fortunate relation produced a perfect male. The remaining eight larvae which I had retained were all affected by parasites of the *Apanteles* family, and these spun the usual oval cocoons on leaving their victims. Six of the larvae were sent to Mr. H. E. Hammond, who informed me later that all were 'stung'. I had not attempted to rear *Limenitis camilla* for a number of years, but some time ago when I had about sixty larvae from the New Forest the majority produced butterflies, and none was affected by parasites. From this scanty evidence it is impossible to draw conclusions about the proportion of *Limenitis camilla* larvae which normally escape destruction from insect foes, but I would be interested to have the opinions of other collectors.—GEORGE E. HYDE, F.R.E.S., 20 Woodhouse Road, Doncaster, Yorks. 28.xi.52.

VARIATION IN PLUSIA GAMMA LINN.—This species varies little in pattern but, in this part of the world at any rate, a good deal in colour. I have often noticed that whereas in the late spring and early summer one rarely sees any but the typical grey form (my few foreign specimens are of this form), in late August and early September a reddish or brownish form predominates and in some years seems to be the only form. This year I kept records of some 200 specimens taken in Folkestone, Kent. Of those taken in May and June 92% were typical, in July 50%, in August 35%, and in September 27%. It looks as if this difference in colour is an effect of the English climate, possibly because the pupal stage lasts longer here than in warmer places. If that is so, the colour might be some indication of whether a particular specimen was an immigrant or a local product.—A. M. MORLEY, 9 Radnor Park West, Folkestone. 26.xi.52.

EARWIGS AND LARVAE.—I have a brood of *Amathes ditrapezium* Schf. now in hibernation. About the time they were going down I looked into the cage one night to see if everything was all right before going to bed. Shining the light on them I saw an earwig sitting on one of the leaves of dock. Slowly and carefully I opened the cage, but he was too quick for me. I dared not disturb the foodplant too much, as some of the larvae had entered into hibernation a few days before. I also knew that if I left the intruder in the cage some at least of my larvae were doomed. Then I had a happy thought: I remembered how earwigs had swarmed at my sugar during the previous season; so I thought I would find out if this specimen also had a liking for sugar.

Carefully I put two spots of sugar inside the cage, one on each side. Believe me, he was there within fifteen minutes. . . . Yes, he is now among the 'dear departed', but not mourned by me!—E. HARRISON, 53 Borrowdale Road, Lancaster. 25.xi.52.

PHEOSIA TREMULA CLERCK (DICTAEA LINN.) AT DEAL.—At Deal on 22nd July 1952 at 11.40 p.m. a male *Pheosia tremula* came into my bedroom, attracted by the light. I had not taken this species before; but I see there have been records for Deal.—C. M. GUMMER, 14 Manor Road, Deal, Kent. 26.xi.52.

STRYMONIDIA W-ALBUM KNOCH AT DOVER.—In a very uneventful season I had the pleasure of seeing what was to me a new species of butterfly in a wood near Dover where I have collected for the last seven years. On 26th July 1952 I saw a fresh specimen of *Strymonidia w-album* Kn. at rest on a bramble bush. I failed to capture it and saw no other specimens.—C. M. GUMMER, 14 Manor Road, Deal. 26.xi.52.

FIFTY YEARS AGO.—I have read the two articles by Mr. S. G. Castle Russell (*Ent. Rec.*, 64: 138 and 243) with mixed feelings. They make me feel I was born too late, particularly as the last few seasons have been so poor with most butterflies scarce. I am sure it will take many years for the common species to build up to the prodigious numbers of former years. With the expansion of large and small towns, increased cultivation of marginal land for agriculture and forestry, I begin to doubt if I shall ever witness a revival of our butterflies, even if we get suitable weather for a number of years. Two other factors cause me great concern, the rapid spread of bracken in the forests and heaths, and hawthorn scrub on the downs. Both these plants quickly choke the growth of the flora and must to a considerable extent reduce the ability of insects to breed. I remember an extensive bank near here that was a lepidopterist's paradise in the 'twenties; *Lysandra coridon*, *L. bellargus*, all the common Browns and *Eumenis semele* could be seen in the utmost profusion. I have never seen the latter species in anything like such numbers since; almost every scabious and other bloom on the flowery hillside would have a *E. semele* settled on it; but now—hardly a butterfly; much of the hillside is covered with scrub, the adjacent road is used as a car park for picnic parties, and another fine locality is lost for ever. I think that once a good spot is continually walked over by human feet the insect population quickly deteriorates. This is a sad state of affairs and I feel in my own mind that the Victorian lepidopterists were indeed fortunate to have lived in a land of plenty.—R. C. DYSON, 112 Hollingbury Park Avenue, Brighton 6. 27.xi.52.

REFORESTING WITH CONIFERS.—Our native deciduous trees are being quickly reduced in number, and where planting is done it is almost exclusively with conifers planted in close proximity for a quick return of soft wood. The need for hardwood in the more distant future is not considered, and yet this is supposed to be an age of planning. What for? A pine wood has a certain beauty, but it cannot compare with the individual fir or the native deciduous trees.

We depend to a large extent on our visitors from abroad to keep our dollar balance. One of the attractions to them is our countryside,

which is fast being ruined by cutting of native trees to plant conifers, or do open-cast coal mining, or to produce water power. Large areas of Scotland are being swamped by hydro-electric schemes thus obliterating large oak and birch forests around the lochs. These should be replaced by native trees and not only firs. In 10-20 years or less these schemes will probably be obsolete on account of atom power.

One of the results of this so-called "advance" is that we are quickly losing a large amount of our native flora and fauna. Surely it is time someone took a stand and gave some advice on the matter. Who is there to do this? The Entomological Society and other nature and countryside lovers could band together and try to move the Powers that Be.

I do not wish to suggest that some mature native trees should not be removed. This is inevitable and necessary but it should be done partly with a view to letting others have a chance and where necessary for other schemes. Some should be planted, *e.g.* round the raised shores of the lochs, above mentioned, but not so thick that the lochs would be screened from the roads. Another suggestion would be to plant a fairly deep border of mixed deciduous trees around all conifer plantations, and also on either side of the rides in order to greatly decrease the danger of forest fires where only conifers are planted.—A. M. R. HERON, M.B., Ch.B., 108 George-a-Green Road, Lupset, Wakefield. 27.xi.52.

COLEOPTERA

In Search of *Strangalia aurulenta* Fabricius

By R. S. FERRY.

I first saw this beautiful Longicorn in the collection of the late H. St. J. Donisthorpe who told me that he had dug his specimens out of birch stumps at Heathfield near Bovey Tracey in Devon. Mr. Donisthorpe very kindly prepared for me a sketch showing me the exact site. Apparently Canadian lumbermen had felled the trees during the 1914-18 war.

A further reference to *S. aurulenta* and Bovey Tracey is made by Dr. Perkins of Newton Abbot who recorded in *The Entomologist's Monthly Magazine* of December 1926 that by hard search he had taken it at Bovey in July and August. Dr. Perkins wrote that the beetle was only active between the hours of noon and 4 p.m. when it may be taken on the wing and that it resembles a Burnet moth in flight. "It settles very low down on the trunks or surface-roots of trees." Although umbels were in fine condition Dr. Perkins records finding none on the flowers.

Mr. Kaufman writing on the Distribution of British Longicorn Coleoptera states that *S. aurulenta* is an uncommon species which is known to be constantly on the move each season and unlike some Longicorns it does not appear to lay its eggs in the trees from which it emerges. He adds that it is to be found in June to August and shows a preference for decaying oak logs.

Primed with this valuable information my wife and I made Honiton our headquarters in July 1948. The trout of the river Otter were

our main object, but on sunny days we proposed to seek out *aurulenta*, subject to our reserves of petrol holding out. We spent in all three days of our fortnight in our search and on each occasion weather conditions were perfect.

Our first expedition covered the Bovey Tracey area. We found Donisthorpe's locality to be quite close to the station, so we parked our car and paid a courtesy call on the stationmaster, making the request to inspect a quantity of felled trees stored in the siding. The stationmaster became immediately interested in our quest when we showed him coloured sketches of *aurulenta*, but neither he nor his staff was able to recognize it.

Digressing from *aurulenta*, I well remember my excitement when showing a sketch of *Aromia moschata* L. to a Hertfordshire waterman. He told me that he had seen an identical beetle within the last five minutes! One can assume that his observation was correct as within the next hour we saw twenty *Aromia*.

Leaving Bovey Tracey station we made a careful search of Heathfield both before and after lunch, but of interest found only *Chrysolina banksi* Fab. and a single Scarlet Tiger-moth. Prior to leaving the area we noticed we were under the observation of an armed policeman who warned us of an escaped convict from Princetown . . .

Following our failure I immediately wrote to Mr. Kaufman, who restored our confidence by telling us that Stoke Woods just north of Exeter was a known locality for *Strangalia* and that alternatively we would be certain to find it in Cann Woods in the Bickleigh Valley near Plymouth.

As Exeter is only sixteen miles from Honiton, we visited Stoke Woods on the 5th July and were very pleased to meet our first Devon Longicorns when we took a series of *Strangalia maculata* Poda prior to entering the wood. The wood proved to be entirely of beech with few tracks and after an hour's walking we realised we were entirely lost. A further hour was spent in breaking through to daylight and open fields. We found one beetle of interest, namely *Cychrus rostratus* L., which I dug out of a rotten log. We were also able to get within a few feet of a buzzard. While walking home on the verge of the wood my wife found a single specimen of *Pachytodes cerambyciformis* Schrank on an umbel.

The next few days were spent on the banks of the Otter where we took long series of four species of *Donacia* and caught a few trout at the evening rise.

We finally decided that we would risk the petrol problem, and at noon on the 9th July we arrived at the forester's cottage at Plymbridge. The forester was unable to recognise *aurulenta* but kindly lent us an axe to battle for this species.

The day was just perfect and there were some beautiful rides bordered by bramble in blossom and a profusion of wild flowers. The first and only capture of Longicornia was a *Leiopus nebulosus* L. which I took off the trunk of a fallen oak. This wood consisted principally of oak and birch and fir plantations. The stakes surrounding the plantations were absolutely rotten and fell apart when touched, but no further beetles were found.

I think our failure both in Stoke Woods and Cann Woods might have been due to the fact that we found only one fallen tree, and all decayed trees had been cleared. However, a more experienced coleopterist might have met with more success with the axe. Nevertheless we did not see a single Longicorn in Cann Woods in flight or among the flowers.

When returning the axe the forester's son told us his father had mentioned our visit and that he had seen an *aurulenta* in flight but had failed to capture it. Whether he was right or wrong we cannot say, but he certainly has not returned the box we left him to post us any captures!

DIPTERA

A Note on *Chrysops melicharii* Mikan

By P. A. H. MUSCHAMP.

In his excellent work on the Tabanidae Surcouf tells us that this gadfly is unknown to him and he doubts whether it has been found in the region covered by his monograph. He gives as probable habitat the Tyrol, the chalkstone Alps of Bavaria and Illyria. I sent flies of both sexes to the British Museum, and Mr. Oldroyd, the Tabanidae specialist, writes to me that the *melicharii* in the B.M. collection bears the label *C. rufipes* Mg.

I captured far more than I could trouble to pin in the first ten days of June 1952 at the little lake of Muzzano, a few miles from Lugano. On the first of June I was sweeping the rushes for small dragonflies when I most unexpectedly netted a *Chrysops* unknown to me. Two days later I revisited the lake and captured nine of this interesting fly, all males. On the 5th there were probably thousands, for I took as many as a score in a single stroke of my net and had a good hundred in my net after sweeping the reeds for a dozen yards along the bank. Then and on the following days the males were more abundant and on several counts averaged about 85 males to 50 females.

On the 12th of June I swept some 200 yards of reeds and did not capture a single gadfly. Their short season was over. Evidently the Tabanidae disappear immediately after the first August storm in Switzerland and the Savoy, but on this occasion no such reason can be given for their vanishing so completely, because the weather was perfect from a collector's point of view.

A less aggressive fly is unimaginable. They never moved from the reeds to which they clung; not a single one did I catch on the wing and, when I plunged my bare arm into my net containing a large number of them, several score crawled on my skin but not a single bite did I receive. Many a nasty bite have I had from members of the *Chrysops* tribe both in Europe and America, so that this absence of what one considers the normal appetite puts *Chr. melicharii* in a class by itself.

There is very little variation in the colour scheme, occasionally the triangles on the tergites are quite evident, and in one fly the black shading of one wing is wanting. If any collector requires a pair of these amiable gadflies I shall be glad to send them.

Another interesting gadfly that I took on the hotel dining-room window was a female *Atylotus gigas* Herbst (*albipes* F.) so completely covered, head, thorax and first segments of the tergites, with fox-coloured fur that the calli are hidden and it might just as well be a *Tabanus* or a *Sziladynus* as an *Atylotus*. In my own and in many Swiss collections that I have examined I have seen nothing like this. Evidently a freshly hatched virgin.

Near Lurengo, facing the Campolungo, two months later I found a certain number of *Straba bromia* with no trace of a purple (or grey) bar on their eyes, both males and females. Rather smaller than *S. regularis* Jaen. they are not easy to differentiate; however I sent a couple to the B.M. and Mr. Oldroyd returned them with the label *T. bromius*. *Bromius*, like one or two other gadflies, does not appear to have acquired a fixed type. 35 Upperton Road, Leicester.

[We welcome the return of Mr. Muschamp to our pages. He is one of the original subscribers to the *Record* and was a friend of our Founder, whom he accompanied on many expeditions in search of Continental Lepidoptera.—Ed.]

Some Records of Bred Tachinidae

By L. PARMENTER.

From time to time odd specimens of bred Tachinidae have been handed or sent to me. As the hosts of only two-thirds of these flies were known to Audcent (1942) and as many of his records were based on a single breeding it was thought worth while to gather together the data available on the specimens I have seen. Several hosts mentioned were previously unrecorded (marked *) so it is hoped that this short paper may interest breeders generally. They can be sure that the flies they breed are at present of more scientific interest than the long series of the lepidoptera which have, in many cases, been bred so many times before. My thanks are therefore due to Mrs. M. Timson, Miss R. Davis, Messrs. M. J. Bennett, N. Birkett, H. J. Burkill, J. F. Burton, B. L. J. Byerley, J. Collins, F. J. Coulson, P. W. E. Currie, T. H. Ford, K. M. Guichard, E. Milne-Redhead, M. Niblett, D. F. Owen, R. G. Shaw, A. H. Sperring, M. F. Taylor, J. Fincham Turner and S. Wakely and especially to Mr. E. C. M. d'A.-Fonseca for his help in the determination of several of the specimens.

Actia frontalis Macq. ♀ bred June 1947 from *Eucosma pfugiana* Fab. in the stem of marsh thistle *Cirsium palustre* (L.) Scop. Bookham Common, Surrey (L.P.).

**Actia pillipennis* Flin. ♂ bred July 1933 from larva, red form, of *Orthosia gracilis* Schiff. on bog myrtle *Myrica gale* L. (F.J.C.).

Aplomyia confinis Flin. ♀ bred May 1948 from a larva of *Strymon w-album* Knoch from Chattenden Wood, Kent (D.F.O.).

Carcellia comata Rond. ♀ bred 1940 from larva of *Arctia caja* L. (N.B.); 1 ♂ 3 ♀♀ bred from a larva of the same species 4th July 1949 from Wembley, Midsex. (M.T.); three from a larva of *Phragmatobia fuliginosa* L. 3rd April 1952 from Ulley, S. Yorks. (T.H.F.).

Carcellia gnava Mg. ♂ bred August 1919 from a larva of *Malacosoma neustria* L. (F.J.C.).

- Compsilura concinnata* Mg. ♀ bred August 1933 from larva of *Aglais urticae* L. from Fetcham, Surrey (H.J.B.); ♀ from pupa of *Pieris brassicae* L. collected 26th January 1949 and another collected in February of the same year emerged 1st May and 19th May respectively, from Petts Wood, Kent (J.F.B.); ♀ from a larva of *Euproctis similis* Fuess. found 17th July, pupated 20th July, and the fly emerged 3rd August 1951, from Batchworth Heath, Herts. (B.L.J.B.); ♀ from a pupa of *Apatele aceris* L. from Blackheath, Kent, found 22nd August, emerged 7th September 1951 (M.F.T.).
- **Digonochaeta setipennis* Fall. 2 ♀♀ bred 21st May from a larva found 17th May 1951 of *Pyrausta nubilalis* Hb. from Stanford le Hope, Essex (R.G.S.).
- Exorista larvarum* L. 2 ♀♀ bred with 4 *Phryxe vulgaris* Fln., see below, 30th June 1950, from a pupa of *Philudoria potatoria* L. from Bratton Fleming, Devon (B.L.J.B.).
- **Exorista* spec. indet. ♀, bred 6th July 1951 from a larva of *Strymon pruni* L. from Monk's Wood, Hunts. (S.W.).
- Frontina laeta* Mg. 14 bred 20th June to 7th July 1951 from a larva of *Smerinthus ocellatus* L. found September 1950 at Ham gravel pits, Kingston, Surrey (E.M.-R.) (see *Ent. mon. Mag.*, **87**: 306); seven emerged 8th June to 3rd July 1952 from a pupa of a larva found August 1951 of the same species of moth, from Sutton, Surrey (J.F.T.).
- **Myxexoristops blondeli* R.D. Four bred May 1947 from a larva of the sawfly *Eriocampa ovata* L. from the New Forest, Hants. (P.W.E.C.).
- **Neara albicollis* Mg. ♀ bred 2nd July 1950 from a larva of *Eucosma fulvana* Stephens feeding on greater knapweed, *Centaurea scabiosa* L., from Riddlesdown, Surrey (M.N.).
- Nemorilla floralis* Fln. Bred June 1937 from a larva of *Nymphalis io* L. from Horsey, Norfolk (K.M.G.); ♂ bred July 1933 from a larva of *Notarcha ruralis* Scop. from South Hants. (A.H.S.).
- **Phebellia glauca* Mg. ♀ bred 25th July 1948 from a larva of the sawfly *Diprion pini* L., found 21st September 1947 at Walton Heath, Surrey (P.W.E.C.).
- Phryxe nemea* Mg. ♂ bred June 1933 from a larva of *Abraxas grossulariata* L. from South Hants. (A.H.S.).
- Phryxe vulgaris* Fln. 3 ♀♀ bred 12th July 1937 from a larva of *Philudoria potatoria* L. found June 1937 at Horsey, Norfolk (L.P.); ♀ bred 4th July 1951 from a larva of *Aglais urticae* L. found 17th June at Totnes, Devon (M.J.B.); 1 ♂ 3 ♀♀ bred 30th June 1950 from a pupa of *Philudoria potatoria* L. from Bratton Fleming, Devon (B.L.J.B.).
- Podotachina sorbillans* Wied. Bred from a pupa of *Saturnia pavonia* L. March 1946 from Aberystwyth, Cardigan (J.C.); 2 ♂♂ 1 ♀ bred 19th May 1951 from a pupa of *S. pavonia* from Ash Vale, Surrey (J.F.B.); ♂♀ bred May 1952 from a pupa of *S. pavonia* from Leiston, Suffolk (R.D.).
- Thelaira nigripes* F. ♀ bred May 1933 from *Arctia villica* L. from South Hants. (A.H.S.).
- Winthemia variegata* Mg. ♂ bred 18th May 1951 from a larva of *Sphinx ligustri* L. from Boxhill, Surrey (S.W.).

**Zenillia ciligera* R.D. ♂ bred 5th August 1951 from a larva of *Hadena bicruris* Hufn. from the Lea Valley, Essex (R.G.S.).

To those wishing to place on record the breeding of Tachinidae may I suggest that it is useful to note numbers and sex of bred specimens, the number of larvae collected, how many were parasitised, whether the flies emerged from the larva, pupa or imago as well as the usual data of locality and dates of collection and emergence.

REFERENCE.

Audcent, H. 1942. A Preliminary List of the Hosts of some British Tachinidae (Dipt.) *Trans. Soc. Brit. Ent.*, **8**: 1-42.

VOLUCELLA ZONARIA PODA AT CAMBERWELL.—On 25th August 1952 I netted a fine specimen of this handsome fly at Denmark Hill, London. The locality was visited again on 30th August, when two more were taken. Another on 1st September was the last seen. They were all taken at rest on the purple flower spikes of Buddleia growing on a bombed site, and seemed very sluggish. As usual with autumn-caught specimens they were all females.—S. WAKELY, 26 Finsen Road, Ruskin Park, London, S.E.5. 5.xi.52.

VOLUCELLA ZONARIA PODA IN N.W. KENT.—At Dartford Marshes on 17th August 1952 I saw a female *V. zonaria* flying around elderberries.—J. F. BURTON, 43 Eversley Road, London, S.E.7. 16.xi.52.

ORNITHOMYA FRINGILLA CURT. ON REDWING.—A Redwing, *Turdus musicus*, collected during the night of 21st-22nd October 1952 at the lantern of the Kentish Knock Lightship (51° 39' N., 01° 40' E.) was found to be carrying a single Hippoboscid, *Ornithomya fringillina*. This bird was one of many thousands of immigrant thrushes which came to light that night during overcast conditions, and may have originated from Scandinavia or areas to the south. Edwards, Oldroyd and Smart (*British Bloodsucking Flies*, 1939) do not record *fringillina* from the Redwing and since the bird would, in favourable conditions, have reached S.E. England it is reasonable to consider that this is a new host record for the British Isles. I am indebted to Mr L. Parmenter for the identification of the fly and for drawing my attention to the published literature.—D. F. OWEN, Edward Grey Institute of Field Ornithology, Oxford. 1.xii.52.

RECORDS OF PROTOCALLIPHORA AZUREA FALL. FROM BIRD'S NESTS IN BERKSHIRE.—In June 1952 examination of about twenty nests of tits in artificial boxes placed on tree trunks at Wytham, Berkshire, revealed many dipterous pupae. These were mainly found among moss, etc., in the bottom of the nests, each nest containing about a dozen pupae. The flies hatched out later in the month and were kindly determined by Mr. L. Parmenter as *Protophthora azurea* Fall., a species whose larvae seem to attach themselves to nestling birds and suck the blood, sometimes causing the death of the host. Audcent (1942, *Trans. Soc. Brit. Ent.*, **8**: 1-42) records the following hosts for this species: Redstart, Blackcap, Great Tit, Coal Tit, White Wagtail, Meadow Pipit, Swallow, House Martin, Sand Martin, House Sparrow, Chaffinch, Yellow Bunting, Rook and Skylark. Those obtained at Wytham were from the nests of Great Tits (*Parus major*), Coal Tits (*P.*

ater) and Blue Tits (*P. caeruleus*), the latter being additional to Audcent's list. In every nest except one there was no indication that the fly had caused damage to the nestling tits, which weighed as much as those whose nests were free from pupae. However, one brood of nine Great Tits died at the age of twelve days and the nest was later found to contain more *azurea* pupae than usual (about 70), thus providing strong circumstantial evidence that mortality was caused by the larvae of this fly.—D. F. OWEN, Edward Grey Institute of Field Ornithology, Oxford. 1.xii.52.

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

BEETLES AND ANTS.—On April 21st I introduced a specimen of this ladybird (*Coccinella distincta*), which I had taken in a nest of *Formica rufa* at Pamber Forest, into my observation-nest. The ants were unable to seize it, its defence being to retract the legs and duck down, when the ant's jaws slip off its shiny elytra. . . . When an ant was forced to take hold of the beetle's leg, it let go at once. Another ant held on for some little time, dragging the beetle about. The ladybird remained motionless with all the other legs retracted, and the yellow exudation which is excreted by the *Coccinellidae* was very apparent. The ant then let go and appeared to be very upset, walking round in circles, and was very languid for a long time afterwards. The beetle walked away unhurt.—H. DONISTHORPE.

REARING PETASIA NUBECULOSA.—I have now a nice number of pupae of *Petasia nubeculosa* that I have reared from ova deposited by a ♀ received last April from Rannoch. This appears to be one of the easiest larvae possible to rear on a birch diet, with a little oak given occasionally, provided that, in their later stages, the larvae are well syringed each morning with a fine-nozzled syringe. This practice holds good also for all the Prominents, and effectually does away with all cannibalism.—JOHN F. MUSHAM.

HYDRILLA PALUSTRIS IN LINCOLNSHIRE.—On June 21st last, Mr. Arnold and myself paid a two days' visit to the Lincolnshire coast sandhills, with the intention of securing a few specimens of *Mamestra albicolarum*, and other early local species. . . . The bag for the two evenings (searching the lyme-grass with a light and sugaring on the land side of the hills) consisted of 14 *Tapinostola elymi* imagines in perfect condition, most of them at rest on the grass-stems with wings closely folded. These we did not expect as it is a much earlier date for their appearance than that given in books; *Practical Hints* states that the pupae are to be found in mid-July and the imagines in later July and early August. One solitary moth beside these we captured at the light *Hydrilla palustris*, ♂, but a very worn specimen It is an unusual occurrence for *Hydrilla palustris* to be taken on coast sandhills, and in Lincolnshire. What is its foodplant, and is it confined elsewhere to fenland districts? There is plenty of fenland between the sandhills and the Woods. . . .—JOHN F. MUSHAM.

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EXCHANGES AND WANTS

Exchanges.—I should like to get in touch with collectors in Great Britain who would exchange Lepidoptera from all parts of the British Isles (butterflies and moths, except micros) for species from Alsace, the Midi of France, and Switzerland. Correspondence in English, French, or German.—*Bernard Meier, Ste. Marie-aux-Mines, Haut-Rhin, France.*

Wanted.—Living females of common species, especially satyrids and fritillaries, from most parts of the country. Will exchange live or dead stock.—*J. F. D. Fraser, 52a Carlisle Mansions, Carlisle Place, London, S.W.1.*

Wanted.—Pupae of Irish or Scottish *O. bidentata*, and ova of wild parents of English *C. elingvaria*. Liberal exchange of English or tropical Lepidoptera.—*W. Bowater, 41 Calthorpe Road, Edgbaston, Birmingham, 15.*

Urgently required during the next few months for research purposes, pupae of *Biston betularia* Linn. (melanic or otherwise). Would be most grateful if entomologists would inform me of approximate percentages of the two melanic aberrations—*carbonaria* and *insularia* and the typical, occurring in any locality.—*Dr. H. B. D. Kettlewell, Department of Zoology, University Museum, Oxford.*

Wanted.—Butterflies of Europe, America, India and Africa in exchange for Butterflies of Malta.—*G. G. Lanfranco, 3 New Str., Sliema, Malta, G.C.*

Wanted.—We are in urgent need of copies of our issue of January 1951. If any of our readers have spare copies for disposal we shall be glad to buy them back at the published price.—*F. W. Byers, 59 Gurney Court Road, St. Albans, Herts.*

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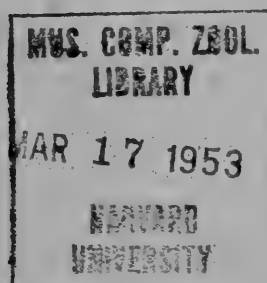
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Aberrations of British Macrolepidoptera.

By E. A. COCKAYNE, D.M., F.R.C.P.

PLATE III.

[The aberration of *Arctia caja* Linn. is in the collection of R. P. Demuth. All the other aberrations are in the Rothschild-Cockayne-Kettlewell collection in the British Museum.]

Arctia caja Linnaeus ab. **stygia** ab. nov. (Fig. 1.)

The forewing is chocolate brown; on each forewing symmetrically placed close to the costa there are two small buff spots, the larger is oval and lies about midway between the base and the level of the discocellular nervure; the smaller is round and is equidistant from the base and the larger spot. Between the discocellular nervure and the margin there is a broad ill-defined pale band starting near the costa and ending near the inner margin; it is semitransparent and many scales are missing owing to the worn condition of the insect, but those present are very pale brown owing to deficiency of pigment or transparent and colourless owing to absence of pigment. The basal part of the hindwing is red, but the border between the middle of the outer row of spots and the margin is pale brown, the scales being incompletely pigmented with blackish brown pigment; the basal part of the costa is whitish and the outer part pale brown; a broad strip along the inner margin is whitish, the scales being very deficient in pigment. The spots are dull black without the usual blue black lustre. The fringe is smoky black. The thorax is dark brown and the abdomen bright red, a brighter red than that of the hindwing, with the usual black dorsal marks.

Type ♂: Hardwicke, Glos., 1952, taken in light trap by R. P. Demuth.

Mimas tiliae Linnaeus ab. **diluta** ab. nov.

The whole of the wings, both ground colour and markings, the head, thorax, and abdomen are very much paler than usual. The name can be applied whatever the colour or marking of the specimen may be.

Type ♂: N. Kent.

Allotype ♀: Kent, bred v.1918 by R. H. Rattray (H. B. Williams coll.) Cockayne coll.

Paratypes 2 ♂, 2 ♀: 2 ♂, N. Kent, bred vi.1947 by L. H. Newman. Cockayne coll.; 1 ♀, Bexley, bred vi.1912 by L. W. Newman (Bright coll.) Rothschild coll.; 1 ♀, Herts., bred 1914 (Willoughby Ellis coll.) Cockayne coll.

Mimas tiliae Linnaeus ab. **rubra** ab. nov.

The ground colour of the basal two-thirds of the forewing and the anterior two-thirds of the margin of the hindwing is vivid carmine pink.

Type ♀: Fordwich, Kent (S. Webb, Crabtree coll.) Rothschild coll.

Laotoë populi Linnaeus ab. **albida** ab. nov. (Fig. 2.)

All parts of the moth, the head including the antennae, the thorax including the legs, the wings, and abdomen are cream coloured; the wings are devoid of markings, but the nervures are visible, being very slightly darker.

Type ♀: Bexley, bred vi.1911 by L. W. Newman. (Bright coll.) Rothschild coll.

Laothoë populi Linnaeus ab. **basilutescens** ab. nov.

The patch at the base of the hindwing is whitish ochreous instead of rust coloured.

Type ♀: Hornsey, N. London, bred by J. A. Clark. (Vauncey Harpur Crewe coll.) Rothschild coll.

Laothoë populi Linnaeus ab. **moesta** ab. nov. (Fig. 3.)

The ground colour of the forewing is dark grey brown with the markings just visible; the nervures are pale; the thorax and abdomen are dark grey brown.

Type ♀: Bradford, 1920. (Willoughby Ellis coll.) Cockayne coll.

Smerinthus ocellata Linnaeus ab. **monochromica** ab. nov.

The forewing is grey with no trace of the usual pink colour; the hindwing also is pure grey without trace of pink.

Type ♀: Worcester, bred 1867 by A. Edmonds. (S. Webb coll. Crabtree coll.) Rothschild coll.

EXPLANATION OF PLATE III.

Fig. 1. *Arctia caja* ab. *stygia*. ♂. Type.

Fig. 2. *Laothoë populi* ab. *albida*. ♀. Type.

Fig. 3. *Laothoë populi* ab. *moesta*. ♀. Type.

Fig. 4. *Argynnis euphrosyne* ab. *edna*. ♂. Type. Upper side. (See p. 56).

Fig. 5. *Argynnis euphrosyne* ab. *edna*. ♂. Type. Under side. (See p. 56).

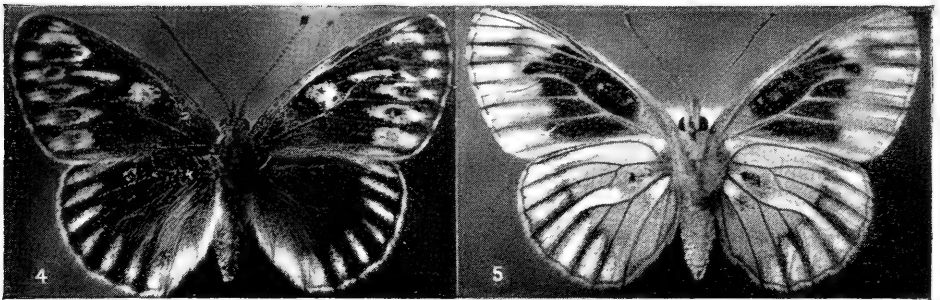
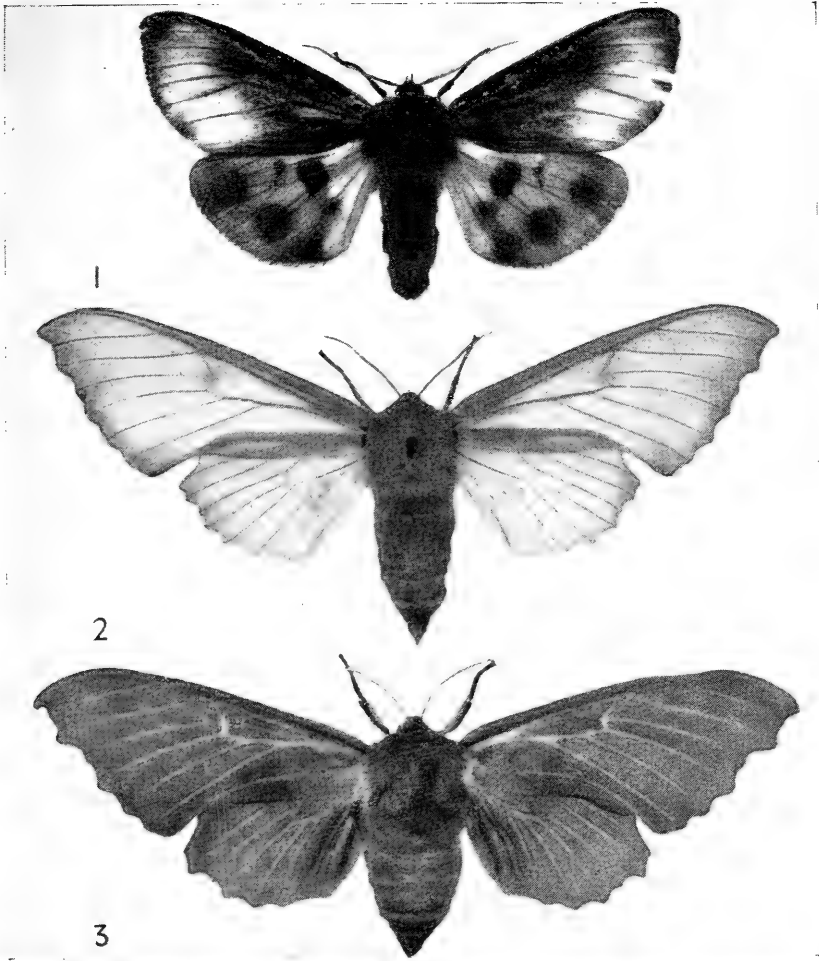
Whither M.V. ?

By W. E. MINNION.

Since Mr. Robinson introduced us to the use of mercury vapour lamps as a means of collecting much has been written and much more spoken on the merits or demerits of this method of obtaining moths. The bulk of the comment has been hostile and in pessimistic vein. We have been told that many species, already apparently scarce, would be wiped out, that others would be reduced to a most precarious state, and so on and so forth. Even Mr. Robinson has been moved to write in defensive tone as if fearful that his disclosure had started an avalanche.

Surely this attitude is all wrong. Let us remember that few of us are in a position to scour the countryside with generators and high-power lamps and that of these few only an unscrupulous minority is likely to make concentrated onslaughts on such species as *Catocala fraxini*, *Sedina buettneri*, etc. Such collectors would be a menace to the species without m.v., but it is open to argument whether their attacks are as potent a factor in bringing about the extinction of an insect as those resulting from Man's interference with its habitat. A good entomologist who uses a portable outfit to secure rarities has only to exercise reasonable moderation and there will be little danger of his activities having a permanently adverse effect on the species.

Apart from the possibility of mass attacks on local insects the emphasis has been mainly on the disastrous effect of the wholesale



slaughter of moths in a trap. This will be referred to later, but another aspect of the problem may well arise from the use of a trap every night in the same place, say in the collector's garden. There seems to be a possible danger of upsetting the natural balance by concentrating a large number of insects in a small area where they would soon be discovered by birds, bats, etc., which would dispose of vast quantities of imagines and also larvae which might result from such a congregation. The entomologist, no doubt, would claim that he killed nothing unnecessarily and released every unwanted moth on the day following capture! Operation on alternate nights to allow natural dispersal in the intervening period might obviate this possibility of unintentional destruction.

Far from exterminating our native moths it seems possible that the advent of m.v. may well go a long way towards conserving them by altering the attitude of entomologists to their hobby. Collecting, purely as collecting, depends upon the quarry being sufficiently rare or difficult to obtain to make it desirable or valuable, and while I am quite sure that nothing short of drastic legislation would stop moth collecting the advent of m.v. may well shift the emphasis away from mere accumulation, which, let's face it, is horribly prevalent today. Interests may well turn towards the study of micros. or other Orders of insects; problems of distribution, frequency of occurrence, time of flight, effects of weather, etc. will surely receive more attention, to the general advancement of our knowledge. Varieties will become more readily available as bases of research in genetics and in the endeavour to discover the frequency with which they occur and the causes of and the conditions most favourable to their occurrence. There is still a lot of work to be done on life-histories and opportunities for this are greatly increased by the use of m.v. Is it too much to hope that the rising generation of moth-hunters, guided by such books as Dr. Ford's volume on butterflies and with the supply of material provided by m.v., will develop a more enquiring turn of mind and use their energies in useful research rather than in filling their cabinets?

Will m.v. have any effect on the auction-room collector? As former rarities become commonplace will prices drop so much as to make sales unprofitable? We must remember that many local species are still just as inaccessible to most of us and also that m.v. has no effect on butterflies. The demand for varieties of these shows little sign of abating and people still fill drawer after drawer of, say, *Lysandra coridon* without ever bothering to learn the first thing about the factors which give rise to the various forms. Many moths vary almost as much and possibly vast series of varieties of such moths may become fashionable. It is to be hoped that the opportunities for more interesting studies now presented will prevent such a development.

There has already been a marked increase in the interest in local lists which is a direct result of m.v. It is in this sphere particularly that the majority of m.v. users who are dependent upon access to mains supply of power and are therefore limited to one or two sites for operation can gather valuable information which will build up our knowledge of distribution and numbers as well as provide a perpetual source of interest to the worker who for economic or other reasons cannot visit

Aviemore, Ham Street or such favoured localities as and when he deems such a visit to be profitable.

The use of m.v. has already shown up our lack of knowledge of many species thought to be rare and demonstrated that their rarity only results from our failure to discover how and when to find them, and I think it has established that far more migrants reach this country than was previously realised. It may well show that some 'migrants' are in fact 'residents.'

I believe that we lepidopterists owe a tremendous debt to Mr. Robinson for his initiation of the second major revolution in moth hunting. There is little ground for pessimism as to its effects on the future. After all, cabinets are expensive and only hold a limited number of specimens, and modern homes only hold a limited number of cabinets, and once the space allotted to each species is filled we shall cease to take that species in its typical form. Our moths will doubtless survive this transitional period and the way will then be clear for the development of a new outlook on the whole subject.

Reverting to the problem of wholesale slaughter of moths in traps, there can be no justification for mass killing apart from its use in organised scientific research which is dependent upon the bodies being available. The use of an anaesthetic in a trap, adjusted to quieten but not kill, is undesirable as, however careful one may be, an overdose can easily be administered and that which seems to have little effect on some species may well have lethal effects on others. Further, moths do not always fully recover from the effects of the vapour and I have had females which seemed quite lively but which failed to lay or if they laid the larvae failed to emerge. I doubt if these females, taken in a trap, had not paired. If a trap must be left unattended for long periods surely the use of egg-trays or some similar material to provide maximum resting surface for the insects is preferable to the use of the mildest anaesthetic. If possible it is better to remain up at night with the trap, examine it frequently, observe the times of flight of the different species, watch for those which go to rest in the herbage without ever reaching the light, and generally to enjoy a few hours' fieldwork made easy.

It has often been suggested that to avoid high mortality a trap should not be used but that a sheet under the lamp should be substituted. Frankly I don't think this idea works. A large number of moths gets trodden on just off, under, and even on the sheet which would have escaped if a trap had been used under periodic observation and without an anaesthetic.

A final point. At m.v. one gets any number of flies, beetles, bugs, etc., as well as moths, but we hear very little of the use of m.v. in connection with other Orders of insects. We have read of hostile hornets, though our local ones, even if of terrifying aspect, are quite well behaved; but little in the way of records of these other insects has been published. We have read of sparrows and other birds raiding traps in early morning, and bats soon learn to 'come to light'; in fact m.v. has opened up all sorts of interesting possibilities. Let's make the most of them!

The Year 1952 in East Essex.

By A. J. DEWICK.

Continuing the Note begun in the May issue of this magazine last year (*Ent. Rec.*, 64: 152) no further *Vanessa cardui* L. was noticed until 30th April, and thereafter it became common. *Plusia gamma* L. first appeared in the trap on 4th May but did not become of everyday occurrence until June. *V. atalanta* L. was first seen on 6th May, but only two more were noticed during the month.

Completely fresh specimens of *V. cardui* appeared early in June. Unless they were fresh immigrants they must have been the offspring of a few specimens which arrived in March or April and escaped notice.

An arrival of migrants seems to have occurred about 12th June when three *Macroglossum stellatarum* L. were seen, with 19 *V. atalanta* next day. That night many *P. gamma* came to the light, the count next day being 1,314, easily the year's largest; three *Nomophila noctuella* Schiff. and three *Anania nubilalis* Hüb. accompanied them. Most of the *V. atalanta* and *P. gamma* must have passed on as both had become uncommon again by the 19th.

Two fresh males of *Colias croceus* Fourc. were seen flying up and down the sea-wall near lucerne fields on 6th July; five *M. stellatarum* were also noticed.

Before midnight on 13th July a very pleasant surprise was the sight of a lovely female *Celerio galii* Schiff. resting quietly in the light-trap. Subsequently rather more than forty eggs were laid; but only twenty seemed to be fertile. From these, 17 pupae were obtained; all seem to be lying over till 1953.

On 16th July a male *Herse convolvuli* L. was in the trap, but no more of this species appeared for a month. At this time little was to be seen of migrants by day, though seven smallish larvae of *M. stellatarum* were noted on the 29th while searching *Galium*, and light produced a ♂ *Nucterosea obstipata* Fab. on 26th July and single *Leucania albipuncta* Schiff. on August 1st, 2nd and 7th. The 13th August marked the start of the best period of the season, a dozen *C. croceus* being seen, one an ab. *helice*.

Next morning a male *Laphygma exigua* Hüb. was found in the trap, while 37 *P. gamma* and 6 *N. noctuella* were higher figures than for some weeks past. A trip to Thanet the same day showed *C. croceus* to be present in small numbers in most lucerne fields visited, at least 30 being noted. As the sky became overcast early in the afternoon a move was made to Sandwich where *V. cardui* was abundant, at least 80 being counted on a mile of foreshore, nearly all in beautiful condition and many feeding at the flowers of sea-holly.

Back in Essex the trap produced a ♀ *H. convolvuli* on the 16th and a ♀ *L. albipuncta* on the 19th, and on the 22nd three *albipuncta* and two more *exigua* as well as 373 *gamma*. On the 23rd two ab. *helice* were noted out of 20 *C. croceus* seen and next day three dozen *croceus* and sixteen *cardui*, the latter being the highest day count since mid-June.

The night of 25th-26th August was a good one for the light-trap, with another ♂ *convolvuli*, five *albipuncta*, a couple of *Phlyctaenia ferrugalis* Hüb., 273 *gamma* and sixteen *noctuella*. Next night was also

good: a pair each of *albipuncta* and *exigua*, three *convolvuli*, 205 *gamma* and a male *Acherontia atropos* L. The last was seen arriving, its curious undulating flight being very noticeable.

Another ♂ *convolvuli* turned up on the 29th and on the 31st, which proved to be the last day of summer, a pair of *convolvuli*, a female *exigua*, five *ferrugalis* and 382 *gamma*. The most shocking weather ensued, the *gamma* dropping to 48 on 1st September and down to zero by the 4th, and for the rest of the season moths never turned up in quantity. Surprisingly, a female *convolvuli* came to the trap on the 6th and a male on the 7th when practically all activity had been stopped by the cold wind. During the rest of the month the odd *atalanta* or *croceus* was to be seen whenever the sun shone sufficiently.

On 20th September, a really lovely day all of a sudden, a walk of several miles along the sea-wall between the Blackwater and Crouch estuaries revealed four *cardui*, twelve *atalanta* and five *croceus*. But the improved weather was short-lived, though two more *cardui* and ten *atalanta* were seen on the 23rd.

It was noticeable from about the beginning of September that most of the *atalanta* in sustained flight were moving southward, though without the urgency of those seen coming north in spring and early summer. Also for the first time during the year *cardui* was scarcer than *atalanta*. *Cardui* finally lasted until 3rd October, *croceus* to the 8th, and *atalanta* to the 18th, though two nights later one was found sitting on the roof of the light-trap at 8.30 p.m. The period 20th-28th October was comparatively good for light with 54 *gamma*, a pair of *obstipata*, and four *ferrugalis* on the 22nd.

In general Lepidoptera have perhaps been scarcer than usual. 307 species of macrolepidoptera were recorded in the light-trap compared with 326 in 1951. Two beautiful specimens of *Anaplectoides prasina* Schiff. (*herbida* Hüb.), which has not been recorded before, turned up on 14th June. One promptly laid a large number of eggs, but all were infertile. Several *Sphinx ligustri* L. appeared in the trap from 24th May, the previous earliest date since the start of my records in 1946 being 2nd June. After a gap (unfortunately the exact dates were not noted) the species became common again, probably about mid-June at which time several two-years-old pupae hatched. If the same thing occurred elsewhere it would support the idea that *ligustri* is reinforced from the Continent from time to time.

The autumn moths did not seem very plentiful, though this was probably due to the weather. Of the 'Sallows', *Omphaloscelis lunosa* Haw. and *Agrochola lychnidis* Schiff. were the commonest. A few specimens of *Lithophane semibrunnea* Haw. were noted from 15th October and *Brachionycha sphinx* Hufn. first seen on the 23rd was, if anything, commoner than usual. As South suggests it is unusual it may be worth recording that two fresh *Pseudoterpna pruinata* Hufn. occurred in late August, the first on the 29th. Another second emergence was *Leucania comma* L. on 6th November.

Specimens of *Nymphalis polychloros* L. are still to be seen in the area, both before and after hibernation, but are less common than they were several years ago. *Strymonidia w-album* Kn. is widespread in the district, but has not been very abundant recently. Some totals of migrant and resident butterflies for comparison with 1951 are:—

	<i>cardui</i>	<i>atalanta</i>	<i>croceus</i>	<i>hyale</i>	<i>urticae</i>	<i>io</i>
1951	10	80	10	36	278	106
1952	489	192	138	—	425	167

Bradwell-on-Sea, Essex.

A Year's Field Work.

By F. M. B. CARR.

It is supposed to be the way of old fogies to exalt the "good old days" and to decry the present. Having collected moths and butterflies on and off since the closing years of the 19th century and become an old fogy myself I am slowly and reluctantly coming to the conclusion that things are not and never will be what they were. My old diaries, contrasted with my diaries for 1945 to 1952, tell the sad tale. The number of species and individuals that so often were encountered during a day's field work fifty years ago is seldom if ever, in my experience, equalled now. Indeed during 1952, and the previous season too, I had several days that might be called "one species days" and but rarely a day of good general collecting. Yet in the period covered by my early diaries, when I was rejoicing in days of variety and plenty, I remember how often I was told by the greybeards what a bad season it was.

Myself when young did eagerly frequent
 Doctor and sage, and heard great argument—
 Yet as they parted all in this agreed:
 "The passing season is the worst we've spent."

Presumably *their* old diaries were also eloquent of a yet more glorious age. What, I wonder, would they have had to say to such a season as 1952? Moral: don't be an old fogy. Invest in a m.v. trap . . . So far I have been unable to cast off my old fogysm sufficiently to do so.—But to come down to the horrid season just past.

The first quarter of the year was only noteworthy for the early arrival of *Vanessa cardui*, already reported in these pages. Early in April larvae of *Arctia villica*, many of them fullfed, were locally plentiful in Bournemouth. They were a remarkably healthy lot, a much smaller proportion than usual being "stung." Towards the end of the month *Ectropis consonaria* began to appear in the Dorset locality in which I had found it two years ago. It was generally and remarkably plentiful in the New Forest too.

In May Dr. H. King and I beat the larvae of *Eilema deplana* locally but freely from spruce in the New Forest. We did not, however, master the secret of rearing them successfully. There was much cannibalism, the criminals being more than once caught in the act. We did our best to keep the algae on which they feed fresh and green, but their deeds of darkness continued, and very few reached the pupal stage. The moths that emerged were undersized. Other larvae beaten in the New Forest during May were *Lymantria monacha* (very scarce), *Nola strigula* (one by Mr. Symes), *Pseudoips bicolorana* (a few), *Catocala sponsa* and *C. promissa* (one), *Lithosia quadra* (one) and *Boarmia roboraria* (fullfed). Dr. King and I were not very successful in several night excursions to the Forest to see what his two Tilley lamps and a sheet would beguile. The best we could do were *Drymonia ruficornis*

(one), *Notodonta anceps (trepida)* (four) and several *Boarmia punctinalis*.

At this point I should explain that this was my first season at Mudeford, about 8½ miles east of my last abode at Sandbanks. I was naturally anxious to find out the possibilities of this now much built over locality. I soon found that mallow abounded and therefore hoped to renew my acquaintance with *Larentia clavaria*. After searching several plants in vain I found more than 20 larvae of varying sizes on two adjacent plants and the surrounding herbage.

About the same time *Eupithecia dodoneata* was coming to light. As I knew that Dr. King was interested I reported the glad news to him, and on 19th May he came over to do some 'dusking.' We found the species flying in some numbers at the flowers of the holm oaks that abound here. A week later Dr. King, Mr. Symes and I hastened into Wiltshire to look for larvae of *Apatura iris*. On arrival my companions made a bee-line for the right sallow bush, on one side of which Mr. Symes found an *iris* waiting for him, whilst on the other side Dr. King found another asking to be taken. It is so easy! But in the meanwhile I was visiting all the wrong bushes. I searched in vain. I beat fruitlessly till the sweat poured from me and my arm ached. No *iris*, no nothing! At long last a tiny miserable scrubby-looking noctuid larva fell into my beating-tray, and in my wrath I was for throwing it to the winds. But better counsels prevailed. I beat no more, but I took the little beast home, and in due time a fine *Zenobia retusa* emerged. But I haven't forgiven him. He ought to have been a Purple Emperor.

Mr. Symes and I had a very pleasant day at Hod Hill on 4th June, where we found *Euphydryas aurinia* still plentiful. But alas! *Lysandra bellargus* has sadly fallen off in numbers during the past three years and shows no sign of recovering. Other species noted included *Hamearis lucina* (nearly over), *Cupido minimus*, *Deilephila porcellus*, *Parasemia plantaginis* and *Procris geryon*.

It is always something of a thrill to make the acquaintance of a species new to one, and on 10th June Captain R. A. Jackson kindly invited Mr. Symes and me to visit the Wiltshire haunts of *Procris globulariae*, which we did under his guidance. The moth was in fair numbers, and flying with it were a few *P. geryon*. A couple of larvae of *Aporophyla lutulenta* were taken at the same time.

During this month I was pleased to find a spot in the New Forest for *Hadena contigua*. I took half a dozen from a row of posts. One moth obliged with eggs, and I now have pupae of the species. The same posts produced a few *H. thalassina*. Larvae of *Drymonia ruficornis* were fairly frequently beaten in the New Forest during June, also a few small *Notodonta anceps*.

Early in July Mr. Symes and I went to East Kent for a week to try for larvae of *Minucia lunaris*. We found them very scarce. Seven hours' very hard work in very hot weather only yielded me half a dozen larvae, and Mr. Symes had a similar experience. Collecting generally was poor. *Paracolax derivalis* was probably the moth most frequently seen, though by no means abundant. I only saw two *Sterrhema marginata*.

At Sandwich *Sterrhia ochrata* was common, but there was no sign of *Aplasta ononaria*. Here Mr. Symes flushed a solitary *Eilema pygmaeola*. A very poor day at Dungeness was only noteworthy for a few larvae of *Hadena albimacula* from *Silene nutans*. *Panaxia dominula* was plentiful but ordinary in its ancient haunt at Kingsdown. We did no night work, and on the whole had a most disappointing week.

Two expeditions with Mr. Symes into the Salisbury area for *Oria musculosa* were badly timed. At the end of July we were too early and three weeks later too late, each visit producing but one moth.

There was little cause for enthusiasm during August. An evening's sugaring in the New Forest with Dr. King produced *Catocala sponsa* and *C. promissa*. Mr. Symes and I took larvae of *Cucullia lychnitis* sparingly in Dorset, and of *C. asteris* in fair numbers in Wiltshire.

In September and October Dr. King and I beat larvae of *Atolmis rubricollis*. They were fairly common, but like those of *E. deplana* not easy to manage, though a few pupae resulted.

Early in September Mr. Symes and I paid a second visit to East Kent hoping for a female *Catocala fraxini*. The evenings were most unpropitious, with clear skies and a nasty cold wind. Not a sign of *C. fraxini*, the best species at treacle being *Aporophyla lutulenta* (one) and a sprinkling of *Asphalia diluta*. In the daytime a few *Colias croceus* were seen, and nearly fullfed larvae of *Clostera pigra* were fairly common.

My best collecting of the season was after dark on my own premises at Mudeford. Here I treacled in the garden throughout August and until 9th November, when the weather became impossible. Cold northerly winds persisted and good nights were few, but I persevered and at least learnt something of Mudeford's possibilities. Seventy species were attracted, of which the most interesting were: *Thyatira batis*, one *Peridroma porphyrea* ab. *majuscula* (of which Tutt says: "This black form is very uncommon in Britain, and I do not remember having seen a specimen of this form"), *Amathes sexstrigata*, *Triphaena interjecta* (one), *Lampra fimbriata* (one), *Hadena suasa* (eggs obtained, and many pupae resulted), *Tholera cespitis* (one), *Procus literosa*, *Aporophyla lutulenta* (two), *A. nigra* (not uncommon), *Nonagria dissoluta* (one), *Arenostola phragmitidis* (two), *Rhizedra lutosus* (one), *Leucania straminea*, *L. l-album* (one), *Caradrina ambigua* (common), some large well-marked forms of *Cirrhia icteritia*, *Citria lutea* (several) and single specimens of *Lithophane socia*, *L. semibrunnea* and *Schrankia costaestrigalis*.

To light, an ordinary 100-watt bulb in my sitting-room window on the first floor, overlooking the garden and Christchurch harbour, about 200 species came during the year. The more interesting of these, in addition to the above, were: *S. fagi*, *P. gnoma*, *N. dromedarius*, *P. palpina*, *H. derasa*, *T. ocularis*, *C. confusalis*, *S. revayana*, some large and very brightly coloured forms of the second brood of *P. fuliginosa*, *C. senex*, *M. miniata*, *E. griseola* and ab. *flava*, *C. coryli*, *A. aceris*, *C. muralis*, *A. ripae*, *C. maritima*, *C. rubricosa*, *Z. subtusa*, *J. pygarga*, *E. silaceata*, *E. rubidata*, *N. obstipata*, *E. arceuthata* and *C. lichenaria*.

Collecting in South Kent

By S. WAKELY.

The following notes on a fortnight's holiday on the southern Kent coast, will, I hope, be of interest. Canon T. G. Edwards made the necessary arrangements and we stayed at a very pleasant house on the outskirts of Dymchurch within a few minutes walk of the sea, arriving there on the 28th June. It was a new locality for both of us, and a happy choice, in every way.

The weather was perfect, and conditions seemed ideal for trying out the Canon's special electric light bulb, so a flex was run out into the garden and the bulb suspended a few feet over a white sheet. We used the light almost every evening during our stay and from about 11 p.m. insects of various orders came in a steady stream, and our captures included many rare and unexpected visitors. The wall of the house being of grey concrete, this often attracted more insects than the sheet, and the spectacle of scores of insects settled on this wall from ground level to the eaves will never be forgotten. Of course, most of the insects were common species, but even these, in many instances, were in such fresh condition and covered such a range of variation that one was tempted to box them. *Malacosoma neustria* L., for instance, varied from pale straw to dark chocolate brown, and *Biston betularia* L. was represented by the peppered, dark, and intermediate forms.

Some nights were certainly more productive than others, but every night produced some species we had not seen previously. I suppose the appearance of *Tethea ocularis* L. was one of the first thrills, especially when two very dark ones were taken. Our total bag of this species was 15, all of which were taken the first week. Being on the Romney Marshes, naturally marsh insects were well represented. Species common on some nights were often rare or absent on others. Small caddis flies simply swarmed at times, and *Acentropus niveus* Ol. was abundant at the sheet on more than one night. I was particularly interested to see the fully-winged female form for the first time, together with the smaller males. An odd capture was a tattered specimen of the banded form of *Angerona prunaria* L., which would surely have been more at home at Ham Street than on the Romney Marshes.

A number of insects attracted by the light found their way indoors and settled on lampshades, walls, and ceilings. An examination of the rooms in the morning often revealed species of interest and the first *Nola albula* Hb. was found in this way by Canon Edwards a few days after our arrival. Several others were subsequently taken at light,, and later we found a spot where it was flying at dusk, enabling us to net others and bring our total of this species up to 15. Kent records of *albula* are not nearly so numerous as from Hampshire, and this was certainly one of our best captures.

Both *Zeuzera pyrina* L. and *Cossus cossus* L. put in an appearance, the former usually being found on the house wall as far as possible from the light. A specimen of *cossus* was seen walking in laborious fashion over the grass towards the sheet.

A pair of the large water beetle *Hydrophilus piceus* L. were found one night on the sheet, and two others came on other nights. One of these, however, flew off again after a time. Another interesting visitor

was the large bug *Reduvius personatus* L., which was boxed off the house wall.

On 5th July we had the pleasure of taking a species new to the British List. This was *Ancylolomia tentaculella* Hb. It reminded me of a large and exaggerated *Crambus chrysonuchellus* Scop. and had a wing expanse of about 30 mm. (See *Entom. Record*, 1952, 64, 273-4.)

I have had no experience of light traps, but from noting the behaviour of moths during this fortnight it seems to me that quite a lot of the specimens seen would not have entered a trap, even although attracted to the vicinity, as they often settled on objects some yards from the light.

A curious fact was the number of "singletons" that appeared—*Pheosia tremula* Clerck, *Leucoma salicis* L., *Earias chorana* L., *Eremobia ochroleuca* Esp., *Hipparchus papilionaria* L., etc., to mention just a few. One would expect to see others of such species during a fortnight, instead of just single specimens. I was also surprised at the very few Tineids that were attracted, although the Pyralids and Tortrices came freely. As a rule the light was switched off about 1 a.m., although on one occasion it was kept on till 2 a.m., with newly-arrived species being noted even up to that time. Some individuals noted one night were observed again the following night, but this was the exception rather than the rule as far as my observation went.

Hawkmoths appeared most nights; but never in numbers. One *Deilephila elpenor* L. used to alight on its back and stay still for an hour or more in this position. Drinkers and Lappets were not infrequent, and used to give us hefty knocks when boxing insects of interest under the light.

The following is a far from complete list of species taken at light, and will give an idea of the numbers seen:—

<i>Laothoe populi</i> L.	<i>Lygris pyraliata</i> Schiff. (1)
<i>Smerinthus ocellata</i> L.	<i>Cidaria fulvata</i> Forst. (1)
<i>Sphinx ligustri</i> L.	<i>Plemyria bicolorata</i> Hufn. (2)
<i>Deilephila elpenor</i> L.	<i>Melanthia procellata</i> F. (1)
<i>Pheosia tremula</i> Clerck (1)	<i>Eupithecia succenturiata</i> L. (1)
<i>Pterostoma palpina</i> L. (2)	<i>Eupithecia fraxinata</i> Crewe (2)
<i>Phalera bucephala</i> L.	<i>Chloroclystis coronata</i> Hb. (4)
<i>Tethea ocularis</i> L. (15)	<i>Chloroclystis rectangulata</i> L.
<i>Euproctis chrysorrhoea</i> Hb.	<i>Angerona prunaria</i> L. (1)
(common)	<i>Semiothisa liturata</i> Clerck (1)
<i>Leucoma salicis</i> L. (1)	<i>Biston betularia</i> L.
<i>Malacosoma neustria</i> L.	<i>Schoenobius gigantellus</i> Schiff.
<i>Philudoria potatoria</i> L.	<i>Schoenobius forficellus</i> Thunb.
<i>Gastropacha quercifolia</i> L.	<i>Acentropus niveus</i> Ol.
<i>Nola cucullatella</i> L. (3).	<i>Anania nubilalis</i> Hb. (2)
<i>Nola albula</i> Hb.	<i>Loxostege palealis</i> Schiff. (1)
<i>Earias clorana</i> L. (1)	<i>Pempelia dilutella</i> Hb. (1)
<i>Sarrothripus revayana</i> Scop. (1)	<i>Dioryctria formosa</i> Haw. (8)
<i>Spilosoma urticae</i> Esp. (4)	<i>Phycita betulae</i> Goeze (1)
<i>Eilema griseola</i> Hb. (2)	<i>Phycita spissicella</i> F. (1)
<i>Cryphia muralis</i> Forst. (3)	<i>Homoeosoma binaevella</i> Hb. (1)
<i>Agrotis clavis</i> Hufn.	<i>Euzophera pinguis</i> Haw. (1)
<i>Bombycia viminalis</i> F. (1)	<i>Acrobasis tumidella</i> Zinck. (6).
<i>Eremobia ochroleuca</i> Esp. (1)	<i>Chilo phragmitellus</i> Hb.

<i>Apamea ypsilon</i> Borkh. (6)	<i>Ancylolomia tentaculella</i> Hb. (1)
<i>Arenostola phragmitidis</i> Hb. (3)	<i>Zeuzera pyrina</i> L. (4)
<i>Leucania straminea</i> Treits. (2)	<i>Cossus cossus</i> L. (2)
<i>Laphygma exigua</i> Hb. (2)	<i>Phalonia hybridella</i> Hb. (4)
<i>Cosmia pyralina</i> View. (6)	<i>Peronea potentillana</i> Cooke (6)
<i>Heliothis peltigera</i> Schiff (2)	<i>Polychrosis fuligana</i> Schiff. (1)
<i>Acontia luctuosa</i> Esp. (1)	<i>Argyroploce purpurana</i> Haw. (1)
<i>Jaspidia pygarga</i> Hufn. (1)	<i>Argyroploce bifasciana</i> Haw. (1)
<i>Plusia iota</i> L. (1)	<i>Eucosma citrana</i> Hb. (1)
<i>Abrostola tripartita</i> Hufn. (5)	<i>Eucosma expallidana</i> Haw. (2)
<i>Laspeyria flexula</i> Schiff (3)	<i>Aristotelia lucidella</i> Steph. (1)
<i>Hipparchus papilionaria</i> L. (1)	<i>Gelechia suppeliiella</i> Wals. (1)
<i>Hemistola immaculata</i> Thunb. (1)	<i>Coleophora spissicornis</i> Haw. (1)
<i>Lygris mellinata</i> F. (1)	

Other orders noted at light were:—Coleoptera—*Hydrophilus piceus* L. (4) and *Serica brunnea* L. (1). Diptera—*Microchrysa polita* L. (common), *Chloromyia formosa* Scop., and *Melanostoma scalare* F. It is regrettable we were unable to identify and record all the species seen.

Species taken at Dymchurch otherwise than at light were *Comacla senex* Hb., *Scopula emutaria* Hb., and *Witlesia pallida* Schiff. *S. emutaria* was locally common and ova obtained with no trouble. The larvae fed on knotgrass and chickweed. A nice series of moths emerged during September, but about half the larvae decided to hibernate. Two *Depressaria* larvae feeding on flowers of the local plant *Oenanthe silaifolia* produced the common *heracliana* Deg., much to my disappointment.

Visits to Ham Street Woods produced larvae of *Minucia lunaris* Schiff. (2) and *Colobochyla salicalis* Schiff. (2), as well as a fine series of *Paracolax derivalis* Hb. *M. lunaris* larvae were scarce whereas the previous year they had been quite common according to reports. The local *Ypsolophus lucellus* F. was often disturbed from the young oak growths, but I was able to net only one of these. One specimen of *Aplasta ononaria* Fuessl. was taken at Folkestone Warren on the 30th June; and a nice series of *Arenostola morrisii* Dale taken on the 5th July at its Folkestone locality at dusk. The latter species is still locally common in a busy thoroughfare in the town. It flies freely from early dusk onwards and what with the curiosity of passers-by and the necessity of dodging motor-cars, collecting this species is a never-to-be-forgotten experience.

Several visits were paid to Dungeness and district, where we took the following species:—

Mesotype virgata Roth.; *Synaphe angustalis* Schiff. (very common); *Hemimene politana* Hb. (a single specimen without the yellow median dorsal blotch), *Mniophaga basaltinella* Zell., *Gelechia diffinis* Haw.; *G. suppeliiella* Wals. (very common among sorrel, but had to be smoked out with help of bee-smoker); *Anarsia spartiella* Schrank, *Depressaria badiella* Hb., and *Leucoptera spartifoliella* Hb. (all three smoked out of low growths of broom); *Ethmia terminella* Fletcher and *E. bipunctella* F. (at rest on fence posts); and *Coleophora otitae* Zell. (larvae cases in plenty on *Silene nutans*). It was pleasing to see both *Ethmia terminella* and *E. bipunctella* still persisting in this district. The seedheads of

Silene nutans showed signs of being eaten, but larvae found proved to be only the common *Hadena lepida* Esp. (*carpophaga* Borkh.).

Ova were obtained of *Spilosoma urticae* Esp. and *Eupithecia fraxinata* Crewe and the resulting larvae reared to the pupal stage with no difficulty on our return.

Inverness-shire in 1952

By Commander G. W. HARPER, R.N.

My first full year of residence in the Highlands has been full of interest to me and the following notes are a few of the salient features.

January ushered in the year with the worst gale, 100 m.p.h. in places, I have ever known ashore; damage to woods and forests was considerable. This was followed by six weeks of snow in deep drifts and hard continuous frost. Thaw came at last on the 15th February, and before the snow had left the lower ground the first *Phigalia pedaria* Fab. appeared at a lighted window, followed by *Erannis leucophaearia* Schf. on the 23rd.

The first week of March saw the first plovers, oyster-catchers and curlews arrive, presaging an early season, which duly materialized and encouraged me to start my home-made m.v. light-trap in my garden, which contains plenty of birch and willow. This resulted in *Achlya flavicornis* L. and *Orthosia incerta* Hufn. on the 12th March; *Colostygia multistrigaria* Haw. appeared the next day, closely followed by all the common hibernating moths and other 'Quakers.' We were spared the English blizzard at the end of the month, though some snow and light frost reduced lepidopterous activity until early April.

On 3rd April the birch woods yielded the first *Brachionycha nubiculosa* Esp., and *Brephos parthenias* L. was flying in the sunshine. Larvae of *Polia tinctoria* Brahm and *Eurois occulta* L. at this date were common on bog-myrtle after dark, but were still small. At Struan on 5th April *Poecilopsis lapponaria* Bdv. was common on fences, where *Cleora cinctaria* Schf. appeared on rocky hillsides on the 29th, but had probably been out a few days. On 21st April the first *Odontesia carmelita* Esp. appeared in my light-trap—a great thrill and a very early date, although the main emergence did not occur until 5th May, when the males came to my portable m.v. lamp in a certain wood in large numbers. This excellent modern invention is an invaluable addition to one's equipment and enables one to sample the insects of different habitats at will.

May was a sunny and warm month; butterflies appeared in considerable numbers, especially *Callophrys rubi* L. and *Pieris napi* L. on 1st May, *Argynnis euphrosyne* L. on 15th, *A. selene* Schf. and *Carterocephalus palaemon* Pall. well out on the 23rd, the males being a little worn. All the usual spring moths too were in good evidence, nearly all appearing several days earlier than I expected. A very pleasing discovery was *Selenia lunaria* Schf., an insect that I had never seen alive before; it was not, however, at all common as was its close relative *S. tetralunaria* Hufn., which swarmed to the m.v. light.

A very cold spell, with snow and frost, ended the month and lasted well into June. Scottish moths must be well adapted to the climate, however, for all species continued to appear early, such as *Perizoma*

albulata Schf. and *Venusia cambrica* Curt. on 15th June, *Aricia agestis* Schf. race *artaxerxes* Fab. on the 20th, *Odezia atrata* L. on 21st; and many Agrotids, such as *Polia tincta* Brahm, *Anaplectoides prasina* Schf. and *Eurois occulta* L. were welcome visitors to sugar and light before the end of the month.

July was a cool and cloudy month, but one sunny day, the 4th, showed *Erebia epiphron* Knoch to be fully out but rather scarce on its breeding ground in the hills. *E. aethiops* Esp. appeared very early, both sexes flying together on 17th July. *Plusia pulchrina* Haw., *P. chrysitis* L., and *P. bractea* Schf. were abundant at flowers and m.v. light; but *P. gamma* L. and *P. interrogationis* L. were scarcer than usual, while the most interesting, because unexpected, absentee was *Apamea exulis* Lef. race *assimilis* Dbld. In 1951 I had obtained a number of this last species without the use of m.v. light; this year neither light nor sugar was of any avail. Autumn comes early in the Highlands, especially in an early season such as this, and the first *Celaena haworthii* Curt. on 24th July, closely followed on the 29th by *Diarsia dahlia* Hub. and *Euxoa nigricans* L., was a clear indication of this.

August was a rather wet cold month, and autumn advanced apace. *Amathes depuncta* L. appeared on the 2nd and was common throughout the month, while the genus *Hydraecia* spp. started on the 5th, all four species, *oculea* L., *paludis* Tutt, *lucens* Freyer and *crinanensis* Burrows having been very kindly determined for me by Mr. W. H. T. Tams of the British Museum as occurring among my local captures. The beautiful Scottish form of *Celaena leucostigma* Hub. also appeared but not commonly. *Aporophyla lutulenta* Schf. was taken on 9th August, followed by *A. nigra* Haw. on the 16th, this species soon becoming exceedingly common, while other common species were *Anchoscelis helvola* L. on 25th and *A. litura* L. on the 30th.

September was colder but drier than August; by the 12th *Dryobotodes protea* Schf. and *Griposia aprilina* L. were common amongst the oaks, and the autumnal Geometers were abundant by the middle of the month, while *Agrochola lota* Cl., *A. macilenta* Hub., *Dasypolia templi* Thun. and *Allophyes oxyacanthae* L. all appeared in the last week to herald the end of the season. This was truly reached by the emergence of large numbers of *Poecilocampa populi* L. accompanied by *Colotois pennaria* L., *Erannis defoliaria* Cl., *E. aurantiaria* Hub. and *Oporinia autumnata* Bork. by 15th October.

Thus ended a most interesting season.

Neadaich, Newtonmore.

Seasonal Change

By PAUL H. HOLLOWAY, F.R.E.S.

A visit to the woods in winter is often productive, the presence of *Erannis defoliaria* and *E. aurantiaria* sometimes being detected by the extrusion of a wing-tip from under the leaf of a low-growing plant. According to my observations the best month for both species is January, contrary to most text-book records. Walking through the woods on a mild January evening with a mantle-lamp invariably attracts

scores of ♂♂ *defoliaria*, while a close scrutiny by day of lichen-covered oaks will normally reveal a few ♀♀. From October to the end of the year they appear frequently, here in Hampshire, but never in great numbers. *E. aurantiaria* is, of course, much more uncertain in appearance. It seems surprising that comparatively little interest exists in *defoliaria*, for surely no other Geometer is more variable and at a time when so few species are in the adult stage we can give it full attention. I remember, a few years ago, walking through the long ride in Park Hills on a January morning. Numerous wings of *defoliaria* were scattered along my path, the bodies obviously having been consumed by entomophagous birds, probably robins and titmice.

In the deeper crevices of the bark of conifers *Graptolitha ornitopus* hibernates; *Erannis leucophaearia* is common enough with an occasional black ab. *merularia*.

But apart from the specimens we find it is so pleasant to ruminate on the past season, to recapture the vision of butterflies in green glades, to look across the waste land on the border sloping to the valley, a brown slope of dried stalks of willow-herb where in the full bloom of summer we searched for larvae of *Deilephila elpenor* in the heat of late afternoon. And we found them, not in that vast magenta sea, but on a few isolated plants at the far end of the valley, shaded by scattered trees. From late summer onwards we witnessed the gradual macro-cosmic change from the deep serenity of sweetly-clad woodland to the bleak and storm-scarred winter scene. The high winds and heavy rain of late September suggested rapid devastation, yet brighter days followed.

On 5th October the gentle warmth of the morning mingled with a touch of the exhilaration of winter. High cirrus formations hung beneath a sky of softest blue, and the butterflies took delight in this day borrowed from summer. Over the fading asters in the garden *Aglais urticae* searched unceasingly; *Vanessa atalanta* and *Polygonia c-album* visited the orchard and *Gonepteryx rhamni* seemed content with golden-rod. A few *Oporinia dilutata* made their first appearance in the woods.

By the end of the month the border of the woods had become a panorama of multi-coloured luxuriance beneath the erratic horizon of tree-tops. Daily the Hymenoptera and Diptera covered the ivy bloom; the moths were there on each mild night in profusion, *Opisthograptis luteolata* being a new-comer this year. It seems strange that the Noctuidae so quickly yield to the intoxicating influence of the bloom, while I have yet to see an inebriated Geometer!

Until the recent innovation of street lamps in my village the brightest lights in the square were in the "Keep Left" signs. Throughout each winter they provided a source of useful collecting on mild nights, my obscure movements arousing some curiosity among rustic onlookers. *Episema caeruleocephala*, *Brachionycha sphinx* and *Poecilocampa populi* were followed by all the early Selidosemidae. The appearance of a ♀ *E. defoliaria* on one of these signs caused a certain amount of conjecture. Did she walk there from the trunk of an adjacent oak, and was the brilliance or the presence of ♂♂ the attraction? And if she was repelled or dazzled by the light was she rendered

incapable of escape, the outer darkness being impenetrable? (As an afterthought, has anyone actually seen a ♂ and wingless ♀ flying in cop., which could account for her presence?)

Many grey dawns will yet unfold until spring meets winter, the depressing odour of vegetable decay still hangs, yet the wild, exciting notes of the song thrush already ring clear and strong again on mild, drizzly mornings. Throughout the dark months there is interesting field work to be done when suitable weather prevails (and especially for the Coleopterist), and with the arrival of spring how satisfying it is to look back upon the success of an active entomological winter.

Current Notes

A pleasant note comes to us from Captain K. J. HAYWARD in Argentina. "My congratulations on the *Record*," he writes, "which goes from strength to strength. It brings back for a moment happy memories of English woods and lanes. The not at all infrequent, or shall I say far too frequent, turning up of new species, sometimes several in the course of a short trip, has never (after my first) given me the same thrill as the first tortoiseshell in spring or the orange-tips that heralded the beginning of another season. I got the same kick out of seeing them again in the first spring days of 1949 after an absence from England of 25 years." Truly the entomologist has joys which are unknown to other men.

The past year seems to have been notable for second broods of several species which normally are single-brooded. Our pages during 1952 contained notices of this phenomenon in *Anthocharis cardamines* L. (p. 288), *Tetthea* or Schf. (p. 288), *Sphinx ligustri* L. (p. 324), *Apatura iris* L. (p. 347) and *Gastropacha quercifolia* L. (p. 347). To this list the late Dr. K. G. Blair has added, in the current issue of *Ent. mon. Mag.* (January 1953, p. 16) *Notodonta ziczac* L., and third broods of *Pheosia tremula* Cl. and *Ectropis bistortata* Göze. But the year cannot compare with that *annus mirabilis* 1893 so far as second broods are concerned.

Under the heading *Field Notes* in our issue of last October (p. 285) our contributor remarked "What a paradox it is that the petrol engine should have so restricted our fields of activity. In the days when one rode about the country on horseback or bicycle more original field work of the right kind was done than has ever been done since." Is it too much to hope that some of our younger readers who are not wedded to a cabinet will mount a bicycle on their holidays this summer and explore some of the 2,500 square miles of central and south-central Wales which have never yet been trodden by the foot of entomologist? There are Lepidoptera, Coleoptera, Diptera, Hymenoptera, Orthoptera—all the Orders of the Class Insecta, to be had in that rich (entomologically) limestone region. Except for the macrolepidoptera the county of Montgomery (800 sq. miles) is almost entirely unworked, and its wooded valleys are rich in micros—and Coleoptera and Diptera. *Criorrhina ranunculi* Pz. is one of 'good things' we have taken there.

We do wish we had more orthopterists among our contributors. The British species of the Order Orthoptera are not particularly numerous and it is something of a reproach to us entomologists that so many parts

of the British islands are still *terra incognita* so far as Orthoptera are concerned. Dr. Burr's admirable handbook *British Grasshoppers and their Allies* is within reach of the most modest purses, and the distribution maps in that volume show at a glance the counties in which field work still remains to be done. The sub-title of the book is *A Stimulus to their Study*. The stimulus is still needed: it is ridiculous to suggest that there are no Orthoptera at all in the counties of Denbigh, Montgomery, Radnor and Carmarthen, not to mention Shropshire; yet virtually none has been recorded therefrom.

Field Notes

During the coming season will those lepidopterists who live in districts where wild raspberry is common bear in mind the possibility that the Clearwing *Bembecia hylaeiformis* Laspeyres may be a British species? It is widespread in France, Belgium, Holland, Denmark and Norway, ranging right up to the Arctic Circle and might well inhabit our island. It is a handsome species, about the same size as *Synanthedon culiciformis*, the abdomen black with three rather broad yellow rings.

The larva feeds in the roots of *Rubus idaeus* and does well on garden raspberry—the cultivated kind is said to yield larger imagines. The life cycle is one-year, and in June the larva makes its way into a dead stem of the previous year's growth, where it pupates. The dead stems are easily broken off, so that the pupae are not difficult to find. The imago flies by day (not, Dr. Hoffmeyer says, by night as most of the books assert) and is on the wing from July to the end of August.

It is unlikely that *Synanthedon conopiformis* Esper, a Western European clearwing that ranges from Brittany to Belgium, would have escaped notice had it been a British species. But since nowadays so many species of Lepidoptera are extending their range on the Continent it might be as well to bear this insect in mind. The larva lives in the trunks of ancient cankered oaks—even in dead trees—forming galleries in the cankerous excrescences. Lhomme records that it has also been found in the stems of mistletoe, close to the base of the plant. The life cycle is a two-year one.

Another Breton clearwing is *Dipsosphaecia uroceriformis* Treitschke, which feeds in the woody stems of gorse and might also be looked for in our south-western seaboard counties. Most of the clearwings fly so rapidly, and resemble Diptera and Hymenoptera so strongly, that they often escape notice, and it would be rash to assume no further additions from this Family will be made to the British list. Indeed it is matter for surprise that only one species—*Aegeria flaviventris* Std.—should have been added to the list of our fauna for more than a century.

Has anybody tried sugaring for the Clearwings? Most of the species seem to emerge about 8 o'clock in the morning, which is rather early to go sugaring, and only a few have been noticed feeding at flowers. But several observers in several countries have mentioned the flowers of wild thyme as being attractive to these moths; so perhaps a few dabs of honey laced with essence of wild thyme on foliage in known or suspected haunts might prove profitable. *Verbum sap.*

Notes on Microlepidoptera

By H. C. HUGGINS.

*Solenobia inconspicuell*a Stainton. The cases of this moth may be collected on lichen-covered tree-trunks, fences, etc., at the beginning of March. I have found it somewhat local but it is usually fairly common where it occurs. As in early years the moth emerges at the end of March or beginning of April the cases should be taken at the very beginning of the month or in late February if possible.

Semioscopus avellanella Hüb. is on the wing at the beginning of March. It may be found by searching birch trunks, but as it is very strongly attracted to light probably few people to-day will adopt the more laborious method. It seems to be universally distributed but to prefer old woods that have not been much replanted.

Acrobasis tumidana Schiff. When writing my notes for November I was unaware that Barrett's *rubrotibiella* had been referred to *Trachonistis cristella* Hüb., as I now see in Dr. Beirne's book. When I saw this moth at South Kensington in 1936 I did not examine it closely, I merely noticed it when working on the *abietella* group and did not wish to trouble anyone to remove the glass so that I could scrutinise the raised scaling, the important point with these insects. Apparently its origin has been suspected, but Barrett was himself of a sceptical disposition and not very likely to be deceived and if a moth has to land from the Continent a salt marsh seems as good as anywhere else. A few years ago I took *Pseudoips bicolorana* Fuess. (*prasinana* L.) at sugar on a post in a saltmarsh half a mile from the nearest oak; it must have been blown there when newly emerged as it was quite perfect.

Euzophera ceratoniae Zell. is one of my headaches. My sole acquaintance with it alive was on 8th July 1933 when I found a very large perfect female sitting on the window of my flat in the London Road, Westcliff-on-Sea. I presumed it had come in with dates or other dried fruit as a larva, but I see Ford (*Guide to the Smaller British Lepidoptera*) says it can only live on green dates, etc. Unless therefore the caterpillar had spun in the corner of a date box before importation and been undetected when I opened it the origin of this moth seems a bit mysterious. On the other hand my late friend B. A. Bower, who was for many years a dried fruit merchant in London, told me that *ceratoniae* only appeared in his warehouse in one year, when it came in quantity with an infected parcel of almonds and he regarded it as a non-hardy dried fruit eater. One would expect, if the larva is a stowaway at date-packing centres, that a few would have arrived at Bower's every year and not several hundred once only.

What is the difference between *pryerella* Vaughan and *phoenicis* Durrant? When Mr. Jacobs showed me his specimens of *phoenicis* I at once referred them to *pryerella*, of which I saw a specimen years ago, I believe in the late Dr. Horley's collection, and of which there

is a figure in Leech. I supposed, however, that although there was, so far as I could see, little or no superficial difference there must be some structural one. Now, however, that *phoenicis* is definitely referred to *ceratoniae* the name seems to me a synonym of *pryerella*.

Practical Hints

Those who have now brought cocoons of *Saturnia pavonia* into a warm room should be careful to prevent the temperature falling below 50° F. if there is a sudden severe frost. A fall in temperature when being forced slows down vitality and thus weakens the moths, so that they are unable to force their way through the 'neck' of the cocoon, or if they do so they are unable to expand all their wings fully. The temperature should not exceed 55° F. for the first fortnight after the cocoons have been brought indoors. At the end of that time the pupae will start to 'rattle,' which continues usually for only two or three days. As soon as they have become silent again the temperature should be raised to 60° F., and the moths will start to emerge in about a week.

During this month inspect the butts of sawlog saplings which have been cut by 'hedgers and ditchers' for poles and are still lying on the ground. Quite often the burrows of *Sphecia bembeciformis* will be seen. Sometimes there are three or even four burrows in a 3-inch pole, each large enough to admit the tip of a ring finger. If these poles are left lying and inspected again in a few days' time it will be seen that the larvae within them have stopped up the mouths of the burrows with chewed wood. The larvae usually pupate at the beginning of June.

Should strong March winds have dried the ground in open wooded country before the next issue of this magazine appears lose no opportunity to employ the moss-pick at the roots of old oaks. The winds will have stuffed the crannies right under the trunks with oak leaves and if these are gently pulled out and examined one is almost sure to find the boat-shaped cocoons of *Bena fagana* Fab. on the underside of dead leaves. Further careful raking of the surface soil in these crannies will most likely (for it is a widespread moth and not at all uncommon) produce the soft, black, oval, silk cocoon, camouflaged with crumbs of earth, of *Drymonia dodonaea* (*trimacula*). These cocoons are very easily overlooked—and very easily damaged. If you have never found one before, squeeze the suspected object *very* gently, when you will (if your luck is in) feel the pupa inside.

When digging and grubbing at the roots of old oaks during the first week of March, if it is an 'early' year always scrutinise the eastern half-circle of the trunk, from ground to a foot up. Often one finds in this way nice specimens of the *Orthosia* genus which have just emerged from the pupa.

If you have stored pupae of *Achlya flavicornis* (and other early species) in tins in a cellar lose no time at all in removing them thence into a pupa-cage. In confinement, even when kept in a low tempera-

ture throughout the winter, *A. flavicornis* sometimes emerges in mid-February. The *Orthosia* genus also emerge unduly early in some years, particularly *O. miniosa*.

Those who want to breed *Graptolitha ornitopus* should keep an eye on oak trunks from now onwards. Female moths collected from trunks in early March will usually lay their eggs freely if put into a laying-cage and fed. The larvae are not cannibals, but they are tetchy, resenting disturbance whether by lepidopterist or their own kith and kin. If too many are kept in the same cage they fight vigorously among themselves and when nearing full growth often bear honourable scars.

Notes and Observations

PLATYPTILIA RHODODACTYLA SCHIFF. IN MIDDLESEX.—In Professor Bryan P. Beirne's book *British Pyralid and Plume Moths* (1952, p. 165) *Platyptilia* (*Eucnemidophorus*) *rhododactyla* Schiff. is stated to have "formerly occurred in a number of places in Kent, Surrey, Middlesex . . . where it has since become extinct." It is of interest therefore to record the occurrence of this moth in a garden near Ruislip on 18th July 1952 where it was resting beneath a light.—W. E. MINNION, 40 Cannonbury Avenue, Pinner, Middlesex. 23.xii.52.

LITHOPHANE SEMIBRUNNEA HAW. IN BOURNEMOUTH.—On 7th November 1952 I was surprised to find a *Lithophane semibrunnea* just inside the window of a small shed in my garden. A few specimens of this moth have been taken recently at sugar by the Rev. F. M. B. Carr and Dr. H. King in the eastern, western and northern outskirts of this large built-up area, but I hardly expected to come across one in the centre of Bournemouth. Ash is almost non-existent in the district, and I am inclined to think that the larvae may have fed on Privet, which is extremely abundant.—H. SYMES, 52 Lowther Road, Bournemouth. 15.xii.52

XYLOMIGES CONSPICILLARIS L. ON DOCK.—I was very interested to learn that with the coming of the m.v. trap *X. conspicillaris* has been found to be, apparently, a 'commoner'. I do not possess one of these traps so cannot say what the situation is in this neighbourhood. At my last vicarage (Hentland, Ross-on-Wye) I had a small uncultivated field. This had a fine crop of docks in it, and on 13th May 1949 I took an ovipositing female which had laid 100 eggs. The following year I again took ovipositing females—one on 12th May and another on the 14th. In addition I found two further batches of eggs. In all instances these eggs were on the flower-stems of the dock at about 3 ft. 6 in. from the ground. The interesting point is that a circle of perhaps 6 yards radius would have covered all the finds of 1949-1950. Incidentally, when freshly laid the eggs can be seen yards away on the red-brown stems. At no other point in the field (approximately 120 × 25 yards) did I find any eggs.—R. BENNETT SISSON, Moccas Rectory, Hereford. 9.xii.52.

MACROGLOSSUM STELLATARUM L. IN 1952.—*M. stellatarum* was fairly common on the red valerian on Brading Down, Is. of Wight, in early

June 1952. I saw half a dozen specimens at once. I also noted four specimens in the Bishop's Stortford College rock gardens in July and August, but have not the exact dates. I saw several on 26th and 27th August flying at 10,000 feet on the southern slope of the Gornier Grate facing Monte Rosa and on the lower slopes of the Matterhorn this year (1952). A few were flying high on the Mettelhorn a day or two later. It was a fine sunny week and the insect was obviously on the move. In the Isle of Wight the *stellatarum* were in the company of a considerable number of *Vanessa cardui* L., and the same insect was flying with it in Switzerland at a high altitude.—CHARLES MELLOWS, Helmdon, Maze Green Road, Bishop's Stortford, Herts. 21.xii.52.

SECOND BROOD OF *GASTROPACHA QUERCIFOLIA* L.—I was much interested in Mr. F. W. Byers' account (*Ent. Rec.*, 64: 347) of his obtaining four specimens of a second brood of this species. In 1933, a very hot summer, Mr. W. L. Rudland of Reading obtained a second brood of *G. quercifolia*, which he reared from the egg. On 7th October he gave me six pupae of this brood, two of which I gave to the late Claude Rippon. All these pupae produced moths. Mine (one ♂, three ♀♀) emerged on 11th and 13th October. As Mr. Byers says, they are very much smaller than normal specimens. The females are not quite as large as an average male, and the male is correspondingly smaller. Rippon had never come across this second brood before, and when I mentioned the subject to the late L. W. Newman he said he had never heard of its occurrence.

Since then I have made several attempts to obtain the second brood, but without success. I have more than once bred early moths which laid eggs in June, five or six weeks earlier than those from which Mr. Byers reared his brood; but the larvae have never fed up at all rapidly. I have sometimes thought that this was due to the fact that the Augusts and Septembers when I was keeping these larvae have always been cold and wet, but that was the case this year too.—H. SYMES, 52 Lowther Road, Bournemouth. 15.xii.52.

OVIPOSITION OF *ODONTOSIA CARMELITA* ESPER.—On 6th May 1945 I was beating birch in some woods on the outskirts of Beaconsfield, Bucks., and found a single egg lying loose amongst the debris at the bottom of the tray. It was the usual Notodont shape, and reference to 'South' suggested that it was *O. carmelita*. I was sceptical and wrote it down as *N. dromedarius*. It was not until six weeks later that I was sure, from the appearance of the larva, that it was indeed *O. carmelita*.

The larva pupated on 2nd July and about three weeks later I was posted to the Far East. A female emerged on 20th May 1946 but was hopelessly crippled. It was brought out to me when my wife joined me at Rangoon in October and it was quite unrecognizable. Sadly I consigned it to the dust-bin. Although the wings had failed to develop the moth laid a number of eggs in the cage—infertile of course.

This egg came from a low bushy birch well inside a thickly overgrown part of the woods. Looking back, it seems to have been a most unlikely place in which to find larvae and I cannot imagine what made me go there. Since then I have been forced to give up the collecting of moths so have not tried for *carmelita* again. During the past year or two this part of the woods has been cleared for building. Fortunately the woods cover a wide area and there is every chance that the species will

survive.—Major W. A. C. CARTER, R.A., Briarfields, Sandels Way, Beaconsfield, Bucks. 22.xii.52.

EMERGENCE OF *AMATHES ALPICOLA* ZETT.—When reading of the capture of larvae or pupae or imagines of *A. alpicola* (*hyperborea*) I notice it is always stated that the perfect insect is obtained in the years of even numbers, e.g. 1950, 1952, etc. I should like to hear whether any correspondents of the *Record* have knowledge of, or have taken, the imago in the years of odd numbers. My knowledge of the insect is almost *nil*, but I imagine that a certain percentage emerges in the odd years, say between 5% and 15%. The life cycle according to all accounts is a two-year one, nevertheless I presume that the life cycle is not so constant that no larvae feed up irregularly or lie over in pupa for another year and so cause an emergence in an odd year.—C. CRAUFURD, Denny, Gallopway Road, Bishop's Stortford, Herts. 6.xii.52.

[South, *Moths of the British Isles*, vol. I, p. 215, says the first British specimen was caught in 1939. J. W. Douglas, the captor (*Entomologist*, 1840-41, 1, 105) says he took it in August 1838. I do not think there is an authentic record of a pupa or moth in an odd year.—Ed.]

SECOND BROOD OF *APATURA IRIS* LINN.—In the *Entomologist* of 1894 (vol. 27, p. 61) C. H. Watson records rearing a single second brood specimen of *A. iris* in 1893. "Whilst searching for the larvae in the New Forest during the week ending August 9th", he wrote, "I found four specimens of *A. iris*. They were all in the second stage, and of course quite a month in advance of the usual time." These larvae were sleeved on sallow at Streatham, London, S.W., and only one was reared, having been brought indoors on 7th October. It pupated on 17th October, and on 6th November the pupa was brought into the "the warmer atmosphere of the kitchen". A female imago, crippled, emerged on 9th November.—Ed.

THERA JUNIPERATA L. IN SURREY.—All through this autumn the weather has been such that few moths have been bold enough to fly. The evening of 1st November, however, was as mild as could be wished, and Mr. Geoffrey Cole undertook to show me the spot where, two nights before, he had taken *Thera juniperata* in somewhat arctic conditions. We parked the car in a lane near Abinger, slithered almost ankle-deep through half-liquid mud along a cart track, and eventually came out on the open downland, part of the ridge which runs along to Ranmore Common. There were plenty of juniper bushes, and I boxed the first specimen of *juniperata* at 5.15 p.m. No more were seen for twenty minutes or so, and they clearly do not normally come up so early (sunset was at 4.34). From about six o'clock they were fairly common, sometimes three or four on a small bush, but rarely on a large one, and several had barely dried their wings. In spite of the warmth the males were very loth to make even short flights, and the females clung so tightly to their foothold that it was sometimes quite hard to pry them loose. Juniper is plentiful in many places along these downs, but *juniperata* seems to be local. From all reports it does not like Box Hill now any more than it did 75 years ago; I have a manuscript record book compiled by Charles Fenn in which he notes: "1887, Oct. 27, Box Hill, scarce".—J. O. T. HOWARD, 11 Grafton Street, London, W.1. 5.xii.52.

EXPERIMENTS ON THE COLOURATION OF INSECTS.—Dr. Saadet Ergene is industriously continuing her experiments on the colours of insects, several of which were described briefly in *Ent. Rec.*, **64**, 353. In two short papers in the *Zeitschrift für vergleichende Physiologie*, Bd., 34, pp. 159-165 (1952), she shows that the diversity of colouration in *Oedipoda* is not genetic. Experimenting with 74 larvae, representing four types of colouration, all adapted their colouration to the background after moulting.

In experiments with the larvae of *Acrida turrita* by blinding them by painting their eyes with opaque lacquer, she came to the conclusion that the integument is capable of direct reaction to the colouration of the environment, independently of the eyes, in the case of red, orange, yellow and violet specimens. With yellow larvae on green ground, the yellow colour was retained after moulting, so that it appears that in this case the eyes play the important part. Green larvae with lacquered eyes placed on green background, after a corresponding period, turned yellow, and so it appears that the eyes play the important part in the case of green larvae.—M. B. 23.xi.52.

BIRDS AND BUTTERFLIES.—Notes on birds pursuing Lepidoptera have appeared from time to time and possibly the following may be of some interest. This last summer I have been able to watch closely and for considerable periods the habits of the Spotted Flycatcher, *Muscicapa grisola* L. A brood of two only was reared in a nest against a stone wall, hidden by a climbing rose. The fledgling is so unlike both parents in colour and markings that I was amazed how soon the young bird acquired the adult plumage. It was seldom that I knew for certain whether I was watching parent or offspring. I mention this as I had wanted to note if the conduct of the young fledgling was the same as that of the experienced parent in so far as recognition of warning colouration and markings is concerned. This problem presented itself when a *Nymphalis io* pitched well in the open on a mown grass lawn with its wings fully extended in the sun. One can imagine few things more conspicuous. Within a few seconds a Flycatcher flew from a low branch and though I heard the click of the beak as the bird snapped at the insect, it failed to pick it up. The insect did not fly, but closed its wings over its back, remaining motionless. Meanwhile the bird rose to make an aerial loop and descended on the insect a second time, flying off with it out of my sight. I was unable subsequently to find any trace of it on the ground. I have not seen *io* attacked thus before. Was this the act of a young inexperienced bird? Ealand in his remarks on warning colours states:—"The young predator soon learns by experience to avoid such bedecked individuals." Does instinct require to be reinforced by experience before being of use to the individual? Not many days later I saw an *Aglais urticae* with unmistakable beak marks on a hindwing. Instances of other Lepidoptera being taken on the wing this year by the Flycatcher in this garden were *Pieris rapae* (or *P. napi*), *Pararge aegeria*, *Maniola tithonus* and a Geometer which looked like *Xanthorhoe fluctuata*. Attempted but missed was *Pararge megera*, and those obviously ignored were *Vanessa atalanta*, *Polygonia c-album* and *Polyommatus icarus*. The birds have since migrated.—E. BARTON WHITE, St. Merryn, Braunton, N. Devon. 30.x.52.

[Mr. D. F. OWEN, who is an authority on this subject, writes:—
 Dr. Barton White's observations are of considerable value in view of the comparatively few records of vertebrates attacking the larger adult Lepidoptera. It is, however, unlikely that the upperside of a *Nymphalis io* presents warning coloration of sufficient magnitude to prevent a bird from eating it. The fact that when the butterfly was attacked it attempted concealment by closing its wings and displaying the dark underside bears this out. The hesitation during the attack was almost certainly due to the difficulty experienced by such a small bird as the Spotted Flycatcher in dealing with a butterfly as large as this. If the bird was a juvenile, as is suggested, its inexperience would hinder it in efforts to obtain food, especially when the prey is rather larger than usual. Mr. D. W. Snow of the Edward Grey Institute of Field Ornithology has been working on the breeding biology of this bird, and he informs me that this year he saw an *io* caught on the wing by a Spotted Flycatcher. In Sweden *Bupalus piniarius* L. seems to form an important item of food for this bird."—Ed.

NEW ABERRATION OF ARGYNNIS EUPHROSYNÉ L. (Pl. III, Figs. 4, 5).—
Argynnis euphrosyne Linnaeus ab. **edna** ab. nov.

Upperside—forewing—ground colour black; along the termen from the apex to the inner margin are five tawny orange wedges, each with an oval black mark in the middle terminating in a point internally; near the apex between the costa and the most anterior of these are two smaller tawny orange marks; near the distal end of the cell is a large oval tawny orange spot with a black central dot; from the distal end of the cell a narrow tawny orange streak runs outwards almost reaching the second tawny wedge.

Hindwing—the whole wing is black with the exception of a row of six interneural tawny orange streaks, the last between nervures 2 and 3; from 2 to the anal angle and beyond it along the inner margin is a tawny orange area extending as far towards the base as the tawny orange streaks; on both fore and hindwing a narrow black border separates the tawny orange marks from the fringe.

Underside—forewing—the base, costa, inner margin, and the broad marginal area are straw yellow; the rest of the wing, the central part, is black with tawny orange nervures. Hindwing—the ground colour is straw yellow; from a point slightly less than two-thirds of the distance from base to margin the first seven interneural spaces are silver, but between nervures 4 and 5 the silver extends into the cell; the silver in each space is outlined narrowly with black; in the cell is a small oval black mark; the nervures are black.

Type ♂: Parkhurst Forest, Isle of Wight, 19.v.1952, taken by John Lobb.—J. LOBB, Fernbank, Yarborough Road, Wroxall, I. of W.

In the Foreword to his "Catalogue of the Lepidoptera of the Bristol District" published in the *Proc. Bristol Nat. Soc.*, 1877-78 (N.S. 2, II, 151) A. E. Hudd wrote: "Mr. H. Jenner Fust, Junior, of Hill, kindly sent me . . . a list of 425 species of Lepidoptera taken near Weston-super-Mare by the late Mr. G. R. Crotch, during his residence at Uphill." Can any of our readers inform me if this list is still in existence? —P. B. M. ALLAN, 4 Windhill, Bishop's Stortford, Herts.

Collecting Notes

NOTES FROM NORTH-EAST HAMPSHIRE, 1952.—The season was, on the whole, disappointing, all methods of collecting producing results below average. *Odontosia carmelita* L. was commoner, however, in April than I have known it previously, and *Limenitis camilla* L. is once more on the increase. *Hyloicus pinastri* L. has maintained its position as our commonest 'hawk', whilst *Perinephela lancealis* Schiff. and *Eupithecia virgaureata* L. were newcomers to my m.v. lamp. *Vanessa cardui* L. was much in evidence in June and I bred over 900 imagines from wild larvae and ova from wild parents. A number emerged in the "greasy and semi-transparent condition" mentioned by South in connection with *Nymphalis io* L., and on 29th July a fine *inornata* appeared which has since passed into the collection of S. G. Castle Russell. Late broods were unusually prominent; *Selenia tetralunaria* Hufn. f. *aestiva* was common and on 29th August I found a brood of over 600 *N. io* at Farnborough—the fourth example of the second brood of this butterfly I have encountered since 1949 in this area. Though many perished in the cold weather which followed in September 300 were reared including several *semi-ocellata* and three *belisaria*, two of which are exceptionally extreme. Larvae of *Vanessa atalanta* L., *V. cardui* and *Aglaia urticae* L. were to be found until the end of the first week of October, all—like my pupae of *N. io*—having survived several degrees of frost. Imagines from pupae brought indoors are still emerging in my house (3rd Dec.). Quite a few of the *A. urticae* have the central area of the underside forewing a rich russet brown in place of the usual yellow. I was away in Sweden from 30th July to 28th August, missing the immigration of *Colias croceus* Fourc., but met with members of a native brood on 22nd September and subsequent days, the previous nights having had as much as five degrees of frost. One female, after laying two infertile eggs in my greenhouse, became torpid, apparently attempting to hibernate. She lived 33 days without food, when sudden warmth stimulated activity, after which she died.—A. W. RICHARDS, Nether Edge, Hawley, Camberley, Surrey. 3.xii.52.

COLLECTING AGENTS.—A farmer friend of mine seeing one of our local boys turning over "cow pats" asked him what he was doing. When the boy answered that he was collecting beetles the farmer asked if he knew me and was greatly amused when the boy said he was my local collecting agent. This same boy, having once failed in his interview examination at the local Grammar School, presented himself for a second time. On being asked his hobby he promptly replied "collecting Coleoptera". Needless to say he is now a pupil at that school.

Many boys in our village have acted as my collecting 'agents'. Some are now married with families but continue to bring me specimens. Throughout each week-end in spring, summer and autumn, jam-jars containing earwigs, cockroaches, bugs and other insects are brought me. Each bearer receives his meed of praise, irrespective of value, and thus enthusiasm continues. This year a ♀ *Prionus coriarius* was brought to me. In addition a Leopard moth and a Small Elephant hawk-moth. In previous seasons the more select species have included a Death's-head

hawkmoth, a Goat-moth, an Oak Beauty and the coleopteron *Agrilus sinuatus*, which was a new record for Hertfordshire.

Talking of collecting agents I have invariably, when on holidays, tried to interest the gamekeepers, water bailiffs and foresters in their local insects and carry a small show-case together with coloured sketches of the more spectacular local Coleoptera. The sketches I distribute, together with a token for baccy as an impetus for sending me specimens. The resulting financial account, however, reflects only debits when compared with my own locals.—R. S. FERRY, Fulling Mill House, Welwyn, Herts.

DIPTERA

Flies at Parsley Blossom

By H. W. ANDREWS, F.R.E.S.

This summer (1952) a patch of parsley in the garden of my cottage at Highcliffe (Hants.) grew right up and flowered. I noticed vaguely a number of flies at the blossoms but did not pay much attention until the latter part of August, when I saw one (*Orthoneura brevicornis* Lw.) that I wanted. This caused me to look more closely at the parsley and, being struck by the variety of species attracted, I started to make a list of them which I continued till the end of September, by which time all the flowering umbels of the parsley had run to seed and no more insects were attracted.

In all I noted 62 species of Diptera, as listed below, and in all probability, had I started my list when the flowers first appeared and also if the weather for a good part of September had been more favourable, this total might well have been exceeded.

Certainly a number of the recorded species were single examples only, but even allowing for this the parsley blossom was far more attractive to Diptera than any other plant in the garden. Adjacent to the parsley plants there was a small patch of marjoram, then some lavender, and then a Buddleia. The Buddleia of course, attracted all the butterflies there were and also many bumble bees, but only comparatively few honey bees, and hardly any wasps or flies; the lavender attracted bumble bees only; the marjoram, bumble bees and honey bees but nothing much else. In contrast to the foregoing I do not recollect ever seeing a bumble bee or honey bee at the parsley blossom, and only once a white butterfly. On the other hand wasps were quite frequent, not molesting the flies in any way, but merely flying in and around the parsley plants and sipping briefly at the flowering umbels.

The nomenclature used follows Kloet & Hincks, 1945, *A Check List of British Insects*, synonyms being added in brackets where thought desirable.

Syrphidae: *Paragopsis* (*Eumerus*) *strigatus* Fall., *Myathropa florea* L., *Tubifera* (*Eristalis*) *tenax* L., *T. pertinax* Scop., *Syritta pipiens* L., *Rhingia macrocephala* Harr. (*campestris* Mg.), *Neoascia* (*Ascia*) *podagrica* Fab., *Chilomyia* (*Chilosia*) *proxima* Zett., *C. vernalis* Fall., *Orthoneura brevicornis* Lw., *Chrysogaster solstitialis* Fall., *Melanostoma melinum* L., *M. scalare* Fab., *Sphaerophoria scripta* L., *Episyrphus* (*Syrphus*) *cinctellus* Zett., *E. balteatus* Deg., *Scaeva* (*Catabomba*) *pyrastris*

L., *Metasyrphus* (*Syrphus*) *luniger* Mg., *Syrphella* (*Syrphus*) *albostrigata* Fall., *Syrphidid* (*Syrphus*) *ribesii* L.

Lauxanidae (Sapromyzidae): *Cnemacantha* (*Sapromyza*) *rorida* Fall.
 Sepsidae: *Sepsis punctum* Fab.

Chloropidae: *Chlorops pumilionis* Bjerk.

Cordyluridae: *Scopeuma* (*Scatophaga*) *stercorarium* L.

Larvaevoridae (Tachinidae): *Epicampocera succincta* Mg., *Meigenia mutabilis* Fall., *M. bisignata* Mg., *Varichaeta radicum* Fab., *Linnaemya* (*Micropalpus*) *pudica* Rond., *Larvaevora* (*Echinomyia*) *fera* L.

Calliphoridae: *Sarcophaga teretirostris* Pand., *S. aratrix* Pand., *Calliphora erythrocephala* Mg., *C. vomitoria* L., *Onesia agilis* Mg., *Melinda gentilis* R.D. (*anthracina* Mg.), *Lucilia caesar* L., *L. sericatu* Mg., *Pollenia carinata* Wain., *P. rudis* Fab.

Muscidae (incl. Anthomyiidae): *Musca autumnalis* Deg. (*corvina* Fab.), *Orthellia* (*Cryptolucilia*) *caesarion* Mg., *O. cornicina* Fab., *Graphomyia maculata* Scop., *Morellia hortorum* Fall., *Azelia macquarti* Staeg., *Limnophora triangula* Fall., *L. maculosa* Mg., *Helina depuncta* Fall., *Hylemyia strenua* R.D. (*strigosa* Fab.), *Pegohylemyia discreta* Mg., *P. fugax* Mg., *Delia cilicrura* Rond. (*florilega* Zett.), *D. trichodactyla* Rond., *Erioischia brassicae* Bché., *Nupedia* (*Nudaria*) *dissecta* Mg., *N. latipalpis* Lw., *Egle aestiva* Mg., *E. radicum* L., *E. parva* R.D., *Anthomyia pluvialis* L., *Caricea* (*Coenosia*) *tigrina* Fab.

I have to thank Mr. E. C. M. d'Assis-Fonseca for his kind help in the correct identification of many of the above species and correlating the old and modern nomenclature.

VOLUCELLA ZONARIA PODA AT DEAL IN 1952.—When I first found a specimen of this large brightly-coloured fly in a wood near here (in 1945, I believe) it was identified as a rather scarce immigrant. Since then I have seen it nearly every year, either in my garden or at ivy blossom in the autumn, but never later than September. My son has also found the species at Ramsgate from time to time, including this year (1952).

As migrant Diptera generally have been very scarce in 1952 the following records of my own may be of interest:—4th August, a male taken in my garden at Buddleia; 11th August, one *V. zonaria* seen in my garden; 12th August, one female seen in the garden; 16th September, one female seen at ivy blossom.

My only previous record of a male *V. zonaria* was on 15th July last year (1951). I have never seen the males at ivy blossom.—C. M. GUMMER, 14 Manor Road, Deal, Kent. 5.xii.52.

ORNITHOMYA FRINGILLINA CURT. ON WHITETHROAT.—While ringing a Common Whitethroat (*Sylvia communis* Lath.), caught in the Heligoland trap at the Dungeness Bird Observatory, Kent, on 2nd September 1952, I found a specimen of *Ornithomya fringillina* Curt. (Diptera, Hippoboscidae) in its plumage. Later, Mr. J. N. Hollyer sent me another specimen which he took from a juvenile Common Whitethroat at the same locality on 7th September 1952.

Incidentally, Dipterists may be interested to know that excellent facilities for the examination of birds for Hippoboscids and other parasites are now available at the new Dungeness Bird Observatory. It is the policy of the Observatory Committee to encourage entomologists to use the Observatory as a base for insect migration studies and local sur-

veys. At present, accommodation of a simple kind exists for five to six people in the Watch House, situated between the Heligoland trap and the Lighthouse, but ornithologists will naturally have priority for this during the migration seasons. Further details may be had by writing to Mr. H. A. R. Cawkell, 6 Canute Road, Hastings, Sussex.—J. F. BURTON, 43 Eversley Road, London, S.E.7. 12.i.1953.

CULICOIDES IN BEDFORDSHIRE.—Downes and Kettle (1952, *Proc. R. ent. Soc. Lond.*, 21: 61-78) have recently separated four species belonging to the *obsoletus*-group of this genus. Dr. G. O. Evans gave me some Diptera collected from pine litter at Woburn (Beds.) in 1950 and a small number of *Culicoides* adults occurred in the August and September samples. From the mounted genitalia the males appear to be 5 *pseudochiopterus* Downes & Kettle, 1 *chiopterus* Mg. and 1 *scoticus* Downes & Kettle.—B. R. LAURENCE, 4 Princes Garth, London, S.E.23.

COLEOPTERA

Collecting Notes on Cerambycid Coleoptera, 1952

By F. A. HUNTER.

Throughout May and the former half of June collecting was done at various localities in the Cambridge district. As might have been expected for the time of year, the hawthorn blossom was by far the most productive source of Cerambycids.

Beating hawthorn at Madingley Wood produced *Grammoptera ruficornis* F. in abundance. This species was exceedingly common, being taken, apart from hawthorn, from *Viburnum lantana*, *Viburnum opulus*, *Acer campestre*, *Quercus* spp., *Rubus fruticosus*, wild roses, elder blossom, and *Heracleum* and other Umbellifer flowers. Also at Madingley *Anaclyptus mysticus* L. was common. Whilst collecting with me my friend D. C. Twinn beat from a single hawthorn tree at the end of a hedge two specimens of the rare ab. *albofasciatus* Degeer. This I believe to be a new county record for Cambridgeshire. *Clytus arietis* L. was also taken sparingly. A single specimen of *Molorchus minor* L. was beaten from *Populus alba*.

In Borley Wood, which lies on the east side of Cambridge but which has a similar flora to Madingley Wood, no specimen of *Anaclyptus mysticus* was seen. From hawthorn blossom a single specimen of *Molorchus minor* was again taken, along with *Rhagium mordax* Degeer and many *Grammoptera ruficornis*. In an oak log I found several Cerambycid larvae feeding just under the bark; these I took to be *Rhagium mordax*. *Alosterna tabacicolor* Degeer occurred occasionally and I took several specimens, mostly singly, from buttercup flowers.

In a small wood near Pampisford a large colony of *Eupatorium* was discovered. On thorough examination with a sweeping-net this plant yielded a long series of *Agapanthia villosoviridescens* Degeer. On one occasion when this locality was visited the *Agapanthia* were seen to be flying freely even during a very heavy shower of rain. Near Pampisford also several specimens of *Stenocorus meridianus* L. were taken from elder and meadowsweet. All these were, however, the colour form of black and orange, which I believe is the typical form. A great deal of sweeping of the roadside vegetation was done in the Madingley area with the

hope of taking *Phytoecia cylindrica* L., but altogether less than a dozen specimens were taken by two of us in several days' collecting. *Tetrops praeusta* L. occurred over a widespread area, but never in plenty in any one place. It was recorded from the Gog-Magog Hills, Borley Wood, and Madingley Wood.

The time between 11th and 30th June was spent collecting in the New Forest area. On visiting Matley Bog, which is at present undergoing vigorous treatment by the foresters, a series of *Leptura scutellata* F. was dug out of a beech log. This beetle was also found in beech and birch logs in other parts of the Forest. It occurred in Queen Bower, on the Balmer Lawn, and specimens were taken flying in Pignal Enclosure and at Whitley Ridge. On the whole this beetle seems to be fairly widespread in the New Forest area, and in this last year (1952), which has been favourable to it, it appears to have been quite common.

Whilst beating among oak trees for *Leiopus nebulosus* L. in Wilverley Walk it was noticed that the neighbouring sweet chestnut trees were infested with Cerambycid larvae. On a thorough examination of the dead lower boughs of these trees several adult *Leiopus nebulosus* were discovered. This beetle has not to my knowledge been recorded from this pabulum in the past. At any rate Kaufmann (*Notes on the Distribution of the British Longicorn Coleoptera*) does not mention it. In Queen Bower examination of other sweet chestnut trees produced only remains of *Strangalia maculata* Poda. This species too has not been recorded by Kaufmann as feeding in sweet chestnut.

Beating the old apple trees in Ramnor Enclosure produced several specimens of *Pogonocherus hispidus* L. but only a single example of *P. hispidulus* Pill. & Mitt. Further specimens of *P. hispidus* were taken from holly trees in Holland's Wood. This was done by beating bundles of bracken which were previously put in suitable places in the trees. *Tetrops praeusta* also occurred on the old apple trees in Ramnor Enclosure and several *Leiopus nebulosus* were taken from the holly trees in Holland's Wood. The only other Lamiinid of which adult specimens were taken in the Forest was *Saperda populnea* L., one specimen only of which was taken on the grass whilst we were pitching our tent on the Balmer Lawn. The white sides of the tent in fact proved to be a most effective beetle trap; during the evenings large numbers of Staphylinidae and other small beetles settled on them. On one occasion a specimen of *Leiopus nebulosus* was discovered on the tent wall.

Strangalia maculata was abundant in many localities where there were plenty of rose and bramble flowers. On examination, however, a large proportion of these proved to be of the type form—*S. maculata maculata*. The other varieties were *ab. disconotata* Pic., *ab. separata* Kauf., *ab. seminotata* Kauf., and some other forms which I have yet to determine. *Strangalia nigra* L., which is a rather more local species than the last, was common on the bramble flowers in Pignal Enclosure and in the more sheltered parts at the edge of the Balmer Lawn. *Strangalia melanura* L., which was abundant last year, was much less common, although towards the end of my stay it began to appear in increasing numbers. It too was taken most often from the bramble flowers.

Leptura sexguttata F. was taken sparingly in a ride in the Whitley Ridge area. This ride too has recently suffered from the energetic

attentions of the foresters who have removed most of the brambles on which this species was taken last year; however, the *Conopodium*, relieved of the competition of the brambles, had become very much in evidence amongst the ground-flora. On these low flowers were many specimens of *Alosterna tabacicolor* and *Grammoptera ruficornis*. A single specimen of *Grammoptera variegata* Germar was also taken from the *Conopodium* in this ride. It may be of some interest to note that *Leptura sexguttata* was taken from the following plants: buttercup flower, dogwood flower, bracken fronds, willowherb shoot, and wild rose flowers.

Among the Tetropiinae *Tetropium gabrieli* Weise was found under the bark of a cut larch log in Wilverley Enclosure—adults, pupae, and larvae were all found. At Setley Common—an area that was burnt out by a fire in 1949—*Criocephalus fesus* Muls. was dug out from the very hard Scots pine stumps. The exit holes showed that a very large number of specimens must have been there, but the weather was hot and the stumps hard, so that only a short series was taken. Again adults, pupae and larvae were all found. *Asemum striatum* L., although found commonly last year, could not be discovered again this time.

Three specimens of *Rhagium mordax* were taken singly from rose flowers on Pignal Hill. Only one adult specimen of *Rhagium bifasciatum* F. was taken. Almost every pine log examined, however, contained the nearly fully grown larvae. Some of these were taken in pill-boxes and have since developed into adults.

In the upper branches of a fallen oak tree I found some very fresh exit holes and on further examination found a Cerambycid larva which may possibly have been that of *Mesosa nebulosa* F. This unfortunately died before the adult could be bred out.

In Queen Bower I took a specimen of *Grammoptera ustulata* Schal. whilst beating a dead hawthorn tree. Further beating both of the same tree and of a nearby dogwood tree produced no further specimens.

On visiting Cheshire at the beginning of July I paid a visit to a heath where I knew *Strangalia quadrifasciata* L. to occur. A thorough examination of all the dead birch stumps in the area I usually visit, however, produced only two very immature larvae. All the stumps had already been 'examined' by some other entomologist!

In Cambridge in late July and early August I examined many of the willow trees which line the lower Cam in search of *Aromia moschata* L. On the hot sultry evenings many specimens of this glorious insect were to be found in the gnarled tops of the pollarded trees. I managed to obtain a good series of both green and coppery forms. Several pairs were taken *in cop*.

At Waterbeach, down the Cam from Cambridge, I discovered some larvae of *Saperda carcharias* L. in the trunks (just under the bark) and smaller branches of a row of pollarded poplar trees. The leaves of these trees had been eaten in the way typical of the adult of this species, but even though an exhaustive search was carried out no adults came to light. The larvae of this species can readily be recognised by the very large size of the wood chips which they extrude from their burrows. Egg incisions were also present at the bases of the branches.

In late August I paid a visit to a farm in Shropshire and on visiting the Brown Clee Hill I discovered a very large population of *Rhagium*

bifasciatum, from which I obtained a good series of adults and a number of pupae.

Looking back on the 1952 season one feels that coleopterists have no cause for dismal complaint that the New Forest is not what it used to be. Lepidopterists probably have good reason for pessimism, but so long as trees grow, Longicorn beetles will also be found.

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

HOW TO FIND *AEGERIA FORMICAEFORMIS*.—I have been investigating the life-history of *Aegeria formiciformis*, and, so far as I can discover, the larva does not here feed in osier stems as is stated in many books, but in decaying stems of *Salix caprea*, more especially in those stems of which one side only has just commenced to decay. I have counted upwards of fifty empty pupa-skins sticking out of the holes in such a stem, whilst, on one occasion, I obtained fifteen pupae by removing a piece of bark from a sallow growing by the side of a stream. Possibly the reason why so many lepidopterists fail to find this species in the northern counties is that they search osier beds instead of the sallows growing by river-beds, where it appears to be very common in many places.—JOHN R. JOHNSON, Gateshead.

FOODPLANT OF *DEILEPHILA ELPENOR*.—Mr. Goss stated that in August 1898 and 1899 he collected numbers of larvae of *Eumorpha elpenor* feeding on *Impatiens fulva*, a North American species of balsam, which has naturalised itself on the Weybridge Canal and on some parts of the Thames. When the balsam was exhausted he supplied the larvae with the usual foodplant of the species, *Epilobium hirsutum*, because it was easily obtainable close at hand. He also offered the larvae *Fuchsia*, *Galium mollugo* and *G. aparine*. The larvae refused to eat any of these plants, and nearly three dozen died of starvation before a fresh supply of the balsam could be obtained from Byfleet or Weybridge. Professor Poulton expressed his opinion that unusual foodplants must be begun from the egg, and, as an example, stated the case of *Phalera bucephala*, which, after being given willow, refused to touch elm, there being with this, as with other species, evidently some sort of gastric association between the larva and its foodplant.

PLUSIA GAMMA L. ON HAM.—At Southampton, on 22nd September, *P. gamma*, with other moths, was swarming at the electric street lamps, and at shop windows, Lipton's hams seeming to be a great attraction, the moths running all over them.—C. W. COLTHRUP.

Current Literature

THE LONDON NATURALIST FOR 1951. Published by the London Natural History Society. Price 7s 6d.

This edition is of special interest to entomologists as it contains more papers on insects than usual. Throughout, the emphasis is on ecological studies and in view of this a certain amount of preliminary listing of the lesser known groups has been necessary in order to form a basis for future work. The long term ecological survey of Bookham Common continues

and papers on the Coleoptera—Geodephaga by A. M. Easton, the Hemiptera—Heteroptera by D. Leston and a supplement to L. Parmenter's paper on the Diptera by M. Niblett, are published in this issue. L. Parmenter has commenced his series of contributions on the Diptera of the London area with an account of the Conopidae. In this he outlines our present knowledge on the subject and includes details of the ecology of each species (so far as is known) including times of flight, host records, and flowers visited. Records of Plant Galls in Surrey, 1951, is the title of another paper by M. Niblett and short papers on the sawflies and lepidoptera of the City Bombed Sites indicate that there are numerous gaps in these studies which entomologists could well attempt to bridge.

D. F. O.

ENTOMOLOGISCHE BERICHTEN, XIV, No. 331, 1 JAN. 1953.

This Dutch journal has an illustrated paper on *Phaenobremia aphidiophora* Rübs. (Dipt., Cecidomyiidae). The species was first described by Rübsamen in 1891. The larvae were found feeding on aphids on *Heracleum sphondylium* L. in Germany. On 21st August 1951, larvae were found feeding on the aphid *Aphis frangulae* Kltb. on leaves of *Cucumis sativus* L. in Holland and the adults emerged in September up to 17th October. A brief summary is given in English and in the references to literature is one to H. F. Barnes, 1929. Gall Midges as enemies of Aphids, *Bull. ent. Res.*, 20: 433-442.

One of the two papers in English is by J. B. M. van Dinther. It describes and illustrates three types of trap, based on the cone in cylinder type, used in breeding Muscidae. With the details of construction are given comments on the use of the traps in the field and suggestions as to their application to other problems of rearing various species of flies that pupate in the ground, and of their use in experiments with baits and attractions. There is a short useful list of references but this omits the fine work of Alvah Petersen, 1947: *A manual of entomological equipment and methods*; Ann Arbor, Michigan.

L. P.

BIOLOGICAL STAINING METHODS. By George T. Gurr. 5th Edition. (5½ × 8½). Four photomicrographs in colour, pp. i-vii + 87. Price 5s. (Post 5s 6d). Published by G. T. Gurr Ltd., 136 New Kings Road, London, S.W.6.

Three pages of general information on staining procedure are followed by 52 pages of detailed staining schedules, mostly of an advanced nature, covering a wide range of purposes.

A short section on embedding materials and mounting media (some of them new arrivals upon the histological scene) is followed by an Appendix of conversion tables, refractive indices and stain solubilities. There is also a Formulary of twenty pages and a general index. The book does not, however, contain a specific stain for chitin, though it has tests for various tissues, cell-contents, fats, sugars, and so on.

It is a well-arranged little book primarily intended for the technician, but entomologists who are interested in the microscopical examination of insect histology and histo-chemistry will find much of value in its pages.

I. R. H. A.

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EXCHANGES AND WANTS

Exchanges.—I should like to get in touch with collectors in Great Britain who would exchange Lepidoptera from all parts of the British Isles (butterflies and moths, except micros) for species from Alsace, the Midi of France, and Switzerland. Correspondence in English, French, or German.—*Bernard Meier, Ste. Marie-aux-Mines, Haut-Rhin, France.*

Wanted.—Living females of common species, especially satyrids and fritillaries, from most parts of the country. Will exchange live or dead stock.—*J. F. D. Fraser, 52a Carlisle Mansions, Carlisle Place, London, S.W.1.*

Wanted.—Pupae of Irish or Scottish *O. bidentata*, and ova of wild parents of English *C. elinguaris*. Liberal exchange of English or tropical Lepidoptera.—*W. Bowater, 41 Calthorpe Road, Edgbaston, Birmingham, 15.*

Urgently required during the next few months for research purposes, pupae of *Biston betularia* Linn. (melanic or otherwise). Would be most grateful if entomologists would inform me of approximate percentages of the two melanic aberrations—*carbonaria* and *insularia* and the typical, occurring in any locality.—*Dr. H. B. D. Kettlewell, Department of Zoology, University Museum, Oxford.*

Wanted.—Butterflies of Europe, America, India and Africa in exchange for Butterflies of Malta.—*G. G. Lanfranco, 3 New Str., Sliema, Malta, G.C.*

Wanted.—We are in urgent need of copies of our issue of January 1951. If any of our readers have spare copies for disposal we shall be glad to buy them back at the published price.—*F. W. Byers, 59 Gurney Court Road, St. Albans, Herts.*

THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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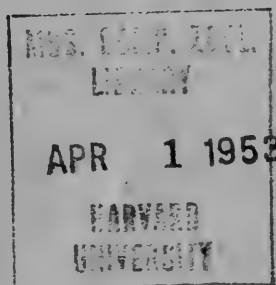
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Some Forgotten Varietal Names

By E. A. COCKAYNE, D.M., F.R.C.P.

In the volume titled *Church Stretton*, edited by C. W. Campbell-Hyslop, printed and published by L. Wilding at Shrewsbury in 1900, there is a catalogue of the Macrolepidoptera found in the neighbourhood of Church Stretton, Shropshire, by F. B. Newnham. This catalogue contains some names of aberrations which did not appear in the *Zoological Record* and are unknown to most entomologists. I think it may serve a useful purpose to publish them again in this JOURNAL. Some are synonyms, but a few are valid. I give Newnham's diagnosis verbatim, but omit some of his comments, and leave his nomenclature unaltered. My own remarks are in brackets.

***Anthocharis cardamines* Lin.**

P. 122. ab. ***arsenoides*** mihi. This form, where the ♀ has partial orange tips to fore-wings was captured by myself in the field immediately opposite the railway station here, on 16th June, 1887. [a gynandromorph].

P. 122. ab. ***androgyna*** mihi. I was fortunate to net, on the 23rd May, 1888, a splendid ab. of this species in which the right wings are those of the ♀ while the left ones offer the colouration of the ♂. [a halved gynandromorph].

***Vanessa c-album* Lin.**

P. 125. ab. ***intermedia*** mihi. Of a very light fulvous, spots very small and few in number. I caught a few specimens of this ab. in the summer of 1893. It makes a splendid link between *c-album* and *Vanessa cgea* Cram. from southern Europe. [This is the colour of ab. *pallida* Tutt, but if the small size and number of the spots are taken into account, it is not a synonym].

***Argynnis aglaia* Lin.**

P. 126. ab. ***nigrans*** mihi. Fore wings black, shot with dark green, a few fulvous spots on disc; spots near hind margin very faint. Hind wings almost as in type. This splendid ab. was taken by myself on 21st July, 1897, near the "World's End".

***Argynnis adippe* Lin.**

P. 126. ab. ***hemicleodoxa*** mihi. Marginal silver spots on the under side of hind wings wanting, these being of a brownish-yellow colour. Found with the type occasionally. [Synonym of ab. *intermedia* Tutt 1896].

SPHINGIDAE.

***Smerinthus populi* Lin.**

P. 129. ab. ***pallida*** mihi. Of a whitish grey colour, much paler than the type. I have reared this form from a larva fed on aspen, *Populus tremula*. [This name has priority over ab. *pallida* Tutt, 1902, but probably refers to the same form.]

P. 129. ab. ***violacea*** mihi. A violet blush over all the wings; obtained now and then with the type. [Tutt referring to a ♂ gives a description of ab. *roseotincta* Reuter, which agrees with Newnham's *violacea*, but Reuter's original description refers to a ♀ and states that

the median and marginal areas are ferruginous and the abdomen and rest of the wings rosy. *Ab. roseotincta* Reuter, 1893, is one of the pink and rufous female forms, which are perhaps sex-linked recessives. It is a synonym of *ab. rufescens* Fuchs, 1889, which was erroneously re-named *ab. fuchsi* by Bartel in 1900. A somewhat different form was described but not named by Selys in 1857. Bartel named this *rufescens* in 1900 and attributed it to Selys with the date 1857, and having made this mistake considered that *rufescens* Fuchs was preoccupied. Actually *rufescens* (Selys in litt.) Bartel 1900 is preoccupied by *rufescens* Fuchs 1889. *Ab. violacea* Newnham occurs in both sexes, though more males than females are caught, and the name is valid].

Chaerocampa elpenor Lin.

P. 130. *ab. cinerescens* mihi. Forewings clouded with grey, so as to absorb in part, the other colours. Reared by myself here in 1891.

ARCTIIDAE.

Chelonia caja Lin.

P. 133. *ab. flavescens* mihi. Hind wings, abdomen, and collar yellow, of almost the same shade as *villica*. [A synonym of *ab. lutescens* Cockerell, 1887].

P. 133. *ab. rosacea* mihi. White markings of anterior wing beautifully suffused with a rosy blush. I have reared both sexes of this charming *ab.* from larvae found here. [*rosacea* has priority over *ab. rumicis* de Hennin, 1910, and *ab. jeuneti* Oberthür, 1911].

P. 133. *ab. albescens* mihi. I bred a ♂ of this species last year, in which the white greatly preponderates over the darker colour of forewings. [The description is not precise; there are several named aberrations of this kind and it is probably a synonym of one of them, such as *ab. lueneburgensis* Mackleidt and Steinwarth, 1884 or 1885].

NOTODONTIDAE.

Cerura bifida Hubn.

P. 138. *ab. aurea* mihi. On the 27th June 1894, I bred this *ab.*, in which the median band on anterior wings is very strongly tinged with orange; this is a beautiful form of the insect.

A Remarkable Aberration of *Arctia caja* L.

By E. S. A. BAYNES, O.B.E., F.R.E.S.

I received recently from Mrs. R. Graves of Valentia Island, Co. Kerry, a specimen of *Arctia caja* L. which she bred from a wild larva found on the island in the spring of 1952. With the exception of a few dark scales in the cilia at the apex of the forewings there are no dark markings at all on any of the wings. Superficially the forewings appear to be plain cream and the hindwings plain orange-red. Unfortunately the moth is crippled, rather badly so on the left side. Mrs. Graves has generously given the specimen to the British Museum. *Arctia caja* Linn.**ab. gravesi* *ab. nov.*

Head and thorax normal. Collar bright red. Abdomen orange-red without the usual transverse dark marks. Forewings cream with the positions of the usual brown markings very faintly visible as a slightly darker shade of cream. Cilia cream with a few dark scales at the apex

of each wing. Hindwings orange-red with the positions of the usual blue-black markings faintly visible as a paler shade in the orange-red. Cilia cream.

Type: ♂, Valentia Island, Co. Kerry; bred 1952 by Mrs. R. Graves. Coll. British Museum, Tring.

[This aberration differs from ab. *phantasma* Niepelt (*Insektenborse*, 1905. 22: 120; *Lepidoptera Niepeltiana* 1914. 5. Pl. 2, fig. 16) which has the forewing cream coloured with no trace of markings, the hindwing red with the middle spot of the outer row yellowish, the thorax reddish-yellow, and the abdomen red with no black markings.

It differs from ab. *mirabilis* Cockayne (*Proc. S. Lond. Ent. and N.H. Soc.*, 1947-1948. 164; Barrett, Pl. 71, fig. 1b) which has the forewing very dark cream with the markings faintly indicated in brownish or greyish cream, hindwing red with yellow spots, thorax dark brown, and abdomen red with black markings reduced in size.—ED.]

Some Experiences in Breeding Varieties of *Panaxia dominula* Linn

By H. SYMES.

It was in 1939 that my interest was first aroused by the late Claude Rippon in the varieties *medionigra* and the much rarer and more striking *bimacula* that occur in the colony of *Panaxia dominula* L. near Abingdon. Rippon had lived for many years within two miles of this locality and had worked it very thoroughly without noticing these varieties. I had taken a number of type specimens here as far back as 1928, and on looking through my series I found one ab. *medionigra* that I had caught in 1935. Among about 70 *P. dominula* taken by Rippon in two days in July 1939 there were three ab. *bimacula* and a much larger number of ab. *medionigra*.

I happened to be working within a comparatively easy distance of Abingdon in 1941 and was able to collect 64 larvae in May. Among the moths bred from these were four *medionigra*. Two of these paired on 1st July, and as I had been told that among the offspring of such a pairing about 25% were likely to be ab. *bimacula* I awaited results with the keenest anticipation. 130 larvae survived the winter, and in April 1942 I divided them into two batches of approximately 60. Unfortunately those in batch A were kept too damp when about to pupate, and only 19 pupae resulted; but batch B produced 48 pupae. From the total of sixty-seven, 45 moths emerged (including 8 cripples), of which 15 were type *dominula*, 22 ab. *medionigra*, and 8 ab. *bimacula*. Moths found dead in the pupa-case included three *bimacula*. These bred *bimacula* were much larger than a wild one that I had taken in perfect condition in this habitat on 23rd July 1941. It was a lovely sight as it sat on a tall reed in the sunshine. I was unable to obtain a pairing among these bred specimens, and thus ended my first attempt at breeding varieties of *P. dominula*. It was not until 1948 that I was able to start another.

There was no petrol allowance for private motoring, so on 5th May I left Bournemouth by the 7.30 a.m. train for Oxford, where I just managed to catch an Abingdon bus which gave me nearly four hours in which to hunt *P. dominula*. The usual foodplant for *dominula* larvae

in previous years had been comfrey; but the place was so terribly overgrown with tall reeds that most of these plants had been choked out of existence, and it was a long time before I saw a single larva. Then I found them in large numbers on willow bushes and during the afternoon I collected 105 larvae. In the absence of low-growing plants they had been forced to take to willow and, to a lesser extent, to bramble. The return journey was very tedious and it was nearly 11 p.m. before I reached Bournemouth.

One of the larvae and two pupae proved to have been stung, but 92 pupated and 84 moths emerged, 76 being type *dominula* and 8 ab. *medionigra*, of which 7 were males. I failed to obtain the desired pairing between two *medionigra* but had four pairings between *medionigra* ♂♂ and type ♀♀. One batch of eggs did not hatch.

On 19th February 1949, during a mild spell, I brought one batch of larvae indoors and began to feed them on *Prunus cerasifera*. As I did not wish all the larvae to feed up before the normal time I left the others outdoors for another month. This was a mistake, as they were nearly all dead by 18th March. The first lot fed up rapidly and one had completed its growth as early as 3rd April. Several *medionigra* emerged between 1st and 4th June, and two pairings took place. A large number of eggs was laid and these hatched on 17th June, but owing to an accident which even now it is painful to recollect all the young larvae were lost. However, a third pair had been caged together and the female laid a small batch of about a dozen eggs. I had no evidence that pairing had taken place, was surprised that so few eggs were laid, and doubted their fertility. But the eggs hatched, the larvae nearly all survived the winter, and of six moths which emerged between 1st and 5th June 1950 three were ab. *bimacula*, two ab. *medionigra*, and only one type *dominula*.

Meanwhile I had started my third attempt at breeding these varieties. On 23rd May 1950 I collected 29 larvae near Abingdon on bramble, willow and comfrey. Among the moths that emerged at the end of June there was only one *medionigra*, a male, but two or three odd forms appeared: (A) one male was without the basal tan spot on both forewings, (B) two females had this spot missing on one forewing, and (C) another had both basal tan spots much reduced in size. Pairings were obtained between *medionigra* ♂ and a B ♀ (Brood 1) and between A ♂ and C ♀ (Brood 2).

In 1951, 17 moths of Brood 1 emerged and 18 of Brood 2. Of the former, 9 were type *dominula* and 8 ab. *medionigra*; of the latter, 17 were type and 1 *medionigra*. It was disappointing that none of the moths inherited the peculiarities of A and B, which I had hoped might lead eventually to the breeding of ab. *basinigra*. Four pairings were obtained between *medionigra* of Brood 1, and about 300 larvae went into hibernation. There was a remarkable discrepancy between these four broods in the percentage of larvae which survived the winter. The whole of Brood 1 perished, while 16% of Brood 2 survived, 10% of Brood 3, and 74% of Brood 4. I gave some larvae before hibernation to two friends, of whom one lost all his, and the other bred only two moths, one type and the other ab. *medionigra*.

By the end of April 1952 sixty larvae had completed their growth, and all but three pupated. The first moth appeared on 1st June, and

to my great satisfaction it was ab. *bimacula*. This proved a happy omen, for out of 54 moths that emerged between 1st and 14th June no fewer than 23 were ab. *bimacula*: 27 were ab. *medionigra*, and only 4 were type *dominula*. I had been led to expect that a pairing between two *medionigra* would produce a ratio of 50% *medionigra*, 25% type, and 25% *bimacula*. In the case of *medionigra* this expectation was realised, but the percentage of type *dominula* was only 7.22 and that of *bimacula* as high as 42.59. A comparison between these figures and the results obtained in 1942 makes interesting reading. In 1942 the expectation for *medionigra* was again correct (49%), but there were 33¼% type *dominula* and 17¾% *bimacula*.

I do not know whether one would be justified in inferring from these figures that the tendency for Abingdon stock to produce ab. *bimacula* is considerably greater now than it was ten years ago.

I had failed in 1942 to obtain a pairing between any of my bred specimens; but this year one pairing took place between two *bimacula* and another between *medionigra* ♂ and *bimacula* ♀. Eggs were laid in both cases, but unfortunately in the latter they proved infertile: a very vigorous brood of larvae resulted from the former and 164 went into hibernation.

Since writing this article my attention has been drawn to a statement in the comprehensive survey of *P. dominula* by Dr. Kettlewell, published in the *Proceedings of the South London Entomological Society* for 1942-43, Part I. On page 5 Dr. Kettlewell says, with regard to 'stung larvae', that he has never met ichneumon fly infection. This assertion lends, I think, additional interest to the undoubted fact that one (and probably three) of the 105 larvae collected by me at Abingdon on 5th May 1948 proved to have been stung: the parasite grubs left the larva when it was nearly full-grown. I wish now that I had kept them and seen what they would have produced, but at the time I did not attach any particular importance to them. Parasites also came out of two pupae, and I think it is much more likely that the larvae had already been stung when I collected them than that a parasitic fly made its way into my breeding-cage and stung two out of a large number of pupae. As far as I remember, the parasites that came out of the pupae looked very much the same as those that had infected the larva, and in each case four or five came out of their host. Parasitic infection of the larva would certainly seem to be extremely rare, as these are the only cases I have met in rearing some 250 wild larvae on various occasions.

Macrolepidoptera in North East Derbyshire : A Record for 1952

By J. H. JOHNSON.

The area under consideration is rapidly undergoing transformation in the same way as many other areas in England. The builders and industrialists are spreading over agricultural land with houses and factories, while the farmers are cutting into the remaining wild places, ploughing up old pastures and moorland and destroying woodland. The insect life must, of necessity, be profoundly modified, not, as in the ordinary course of natural development from century to century, but from year to year. In the case of opencast coal-mining, hundreds of

acres of topsoil have been stripped off with the inevitable destruction of billions of insects which existed on them. No doubt that when the ground is replaced the insects will return, but will the same species recolonize, or will new species take advantage of the changed conditions? This and many other allied questions can only be answered by making accurate observations, measurements and records. I am not aware of any standard method of measuring insect populations, so I have determined to record every specimen of the macrolepidoptera which I have taken or observed definitely in 1952 so that I, or other workers, may be able to make comparisons in other years or other places. Entomologists have collected in this area in the last century, and in the early part of this one, but there are no records of what they did to be found. That was the chief reason for my attempt to make a start in 1952, before the countryside has completely changed.

I do not pretend that I have made a complete list of species in this area, that is a task beyond any one man of limited leisure, but I believe it is a "fair sample" of what any experienced collector might make in an average season's work with light, "sugar," beating, and searching. "Sugar" has been used fairly regularly and a light trap, 60-watt. box-type, has been operated from dusk to dawn during July and August in one spot overlooking wasteland, pasture, parkland, allotments and disused pit tips. Street lamps have been worked during the winter months, while walls have been carefully searched throughout the summer. Beating and searching for larvae have been carried on regularly since some species are seen only in that stage.

The area covered stretches from Darley Dale in the west to Scarcliffe in the east, a distance of about fourteen miles. The underlying rock formations are, from west to east, carboniferous limestone, millstone grit, coal measures and magnesian limestone, and the altitude varies from 1000 feet to 300 feet above sea level. At the present time there are several large areas of mixed deciduous woodland with large areas of bracken and birch scrub which are now in process of conversion to arable land. There are several large parks with very old oaks and beeches, unfortunately surrounded by large areas of arable and open-cast land. There is also a large area of *calluna* moorland, which owes its existence wholly to the red grouse and the Englishman's love of sport, since it can be made to grow certain hardy types of cereal. The most productive areas at present—I am speaking of insects—are the old heaps of colliery waste thrown out by coalminers during the last 150 years. The more ancient ones are now completely wooded over, the recent ones support hawkweed, thistle, ragwort, wormwood and willow-herb, which plants have great attraction for a variety of moths. At present agriculture seems to be the greatest threat to the abundance of lepidoptera; no farmer can bear to see a wild flower of any species, the plough carves the ground up to the very base of fence and hedge, and every roadside and hedgeside is scythed as soon as the herbage is long enough to cut. On the other hand industry, like towns and cities, seems to foster its own little fauna, for example, *Deilephila elpenor* L. and *Cucullia absinthii* L. are as common on pit tips as anywhere.

The types of vegetation are of great importance to the insect population and so are the varying meteorological conditions. Throughout 1952 the weather was recorded regularly three times daily at a spot in the

centre of the area observed, at a height of 382 feet above sea level. There is a considerable variation of temperature and probably of rainfall over the whole of North East Derbyshire, but I will give an analysis of some of the climatic data recorded so that once again comparisons can be made of the same phenomena in different years and places.

TEMPERATURE °F.

	Maximum	Minimum	Average at 9.0 p.m.	Rainfall	Prevailing Wind.
January	51	17	36.3	3.09 ins.	N.W.
February	61	22	38	.41	N.W.
March	63	24	42	2.22	S.W.
April	74	29	49	1.96	S. and W.
May	81	41	55.6	2.81	S.W.
June	85	41	59.4	3.00	N.W.
July	86	46	62.8	1.15	N.W.
August	76	44	61.4	2.32	N.W.
September	68	36	51.2	2.48	N.W.
October	58	31	46.5	4.36	S.E.
November	53	21	38	2.08	N.W.
December	49	23	37.15	2.54	N.W. and S.W.

Total Rainfall ... 28.42 ins.

It is possible that the weather of 1951 will have had some effect on the insects of 1952 but I cannot give those records, nor can I give records of sunshine hours. Dr. B. P. Beirne has, in several places, stressed the necessity for correlating weather conditions and insect appearance. It would be of great assistance to observers if he, or some other responsible entomologist, would specify exactly which aspects of the weather should be recorded, so that some standard measure could be formulated. It may be that weekly averages would be more useful than monthly ones. This was the opinion of Major Gunton in his stimulating book "Nature Study above and below the Surface" (1938). Perhaps he is right. I will leave the decision to others. In his "Entomologist's Companion" as long ago as 1854, H. T. Stainton emphasised that every nook and cranny must be ransacked by some observing entomologist so that the harvest might soon be gathered in. His "Manual" gives the distribution of most species with accuracy, but he gives no yardstick whereby we can measure the abundance of any insect and this seems to be one of the great needs of the moment. The difficulty, of course, lies in the different degrees of attraction exercised by the various lures of the entomologist. For example, I obtained at light 250 *Luperina testacea* Schiff. but only 2 at sugar, while I obtained 25 *Amathes xanthographa* Schiff. at light but 340 at sugar. At the moment we can give only comparative population figures.

In the following list, the number in parentheses after the name is the number of moths of that species taken in 1952 by all methods. The dates are first and last appearances. In the case of extreme abundance, where it was thought impossible to count, I have put "myriads". I have given only the date of first appearance in the butterflies in some cases as they were too abundant to count every day.

RHOPALOCERA.

Pararge megera L. May 24. Abundant.

Maniola jurtina L. June 27. Abundant.

Coenonympha pamphilus L. May 24. Abundant.

Vanessa atalanta L. (17). July 5. October 14. These were taken at thistles. 24 larvae were found at Alton on August 21 and all produced perfect imagines.

Vanessa cardui L. (26). May 10. August 14. Mainly taken on thistle beds near Clay Cross Co. Iron Foundry. No larvae found.

Aglais urticae L. April 14. Extremely abundant. It was possible to count 100 any afternoon in August.

Nymphalis io L. (8). April 14. August 21. The shortage of imagines is hard to understand in view of the extreme abundance of larvae in the area in 1951, when a colony consisting of an estimated 2,000 individuals was found in the neighbouring Clay Hole, and another of 2,000 was discovered at Ogston about 3 miles away.

Polymmatius icarus Rott. (18). June 27. September 1. Usually found in waste places.

Lycaena phlaeas L. (27). June 10. September 1. It is difficult to understand why this species is so uncommon when the foodplant is so abundant on every pit tip.

Callophrys rubi L. May 4. This species is locally abundant in May and June on Darley and Beeley Moors, and in 1952 it was possible to take 20 in 30 minutes on any sunny afternoon in those months.

Pieris brassicae L. May 12. I should say that this and the following species were as abundant as always.

Pieris rapae L. May 12.

Pieris napi L. July 28.

Anthocharis cardamines L. (5). April 25. May 4. Larvae found on *Sisymbrium officinale* in clearings in Tupton Woods.

Ochlodes venata Br. and Grey. June 15. Too abundant to count everywhere.

It is obvious from the above short list that this area is not well favoured by butterflies. Perhaps it is too cold and damp.

HETEROCERA.

Laothoe populi L. (7). May 26. July 19. On May 26 two pairs were found in cop. in Heath School gardens. One female produced 120 eggs from which 42 imagines were bred in August. It is the first time that I ever saw this species complete the cycle in one season. Larvae were scarce, only 2 were found altogether.

Deilephila elpenor L. (1). July 9. This specimen came to a lighted window. By searching low-lying wasteland 72 larvae were found on Rosebay Willowherb (*Ent. Rec.*, 64, 350). No larvae were found in woods or on the moors; this species seems to prefer built-up areas.

(To be continued)

Butterflies at Winchester in 1951 and 1952

[The Winchester College Natural History Society has compiled a useful List of the Lepidoptera taken and observed in the neighbourhood

of the College in 1951 and 1952. We have pleasure in printing the part relating to the Rhopalocera.—Ed.]

The summer of 1952 was notable for an unusually warm, dry spell during June and July. This hastened the emergence of many species, some of which were on the wing a fortnight earlier than in 1951. Conspicuous among these was *Maniola jurtina* (Meadow Brown), which was common by the 24th June but already becoming scarce by the beginning of August. In 1951 it was still to be seen in early September, having started to emerge during the first week of July.

Varying weather conditions may have been at least partly responsible for the remarkable fluctuation in the numbers of certain species of butterflies in Hills Valley. The Marsh Fritillary (*Euphydryas aurinia*) was not recorded there prior to 1949. By 1951 it was swarming and it was still common, but in reduced numbers in 1952. All the 'Skippers' showed a marked increase in numbers in 1952, particularly *Ochlodes venata* (Large Skipper), which was not seen at all in 1951.

Pieris brassicae (Large White): Not so common in 1952 as in 1951.

Pieris rapae (Small White): Not so common in 1952 as in 1951.

Pieris napi (Green-veined White): The commonest 'White' in both years, especially in Crab Wood.

Anthocharis cardamines (Orange-tip): Later and less common in 1952 than in 1951. River area.

Colias croceus (Clouded Yellow): Not very common in 1951; only one seen (5th July) in 1952.

Gonepteryx rhamni (Brimstone): Fairly common the whole year. March and July 10th-Oct. 15th.

Limenitis camilla (White Admiral): Fairly common in 1951; much more common in 1952 (especially 3rd-10th July). Crab Wood, Fisher's Pond. One ab. *nigrina* seen sitting on a bramble in sunshine 5th July 1952. It was much less shy than others.

Polygonia c-album (Comma): Only a few seen both years (mostly first brood).

Aglais urticae (Small Tortoiseshell): Very common both years from May to October. St. Catherine's Hill.

Nymphalis polychloros (Large Tortoiseshell): One probably seen sunning itself, 24th July 1952, in Kingsgate Street.

Nymphalis io (Peacock): Exceedingly common both years in July. St. Catherine's Hill, Crab Wood.

Vanessa cardui (Painted Lady): Rare both years; distributed evenly over the summer.

Vanessa atalanta (Red Admiral): Rare both years, June to October. Mostly in Hills Valley.

Argynnis paphia (Silver-washed Fritillary): Common both years during the whole of July in Crab Wood; mostly males. Two ab. *valesina* were seen in Crab Wood in 1952.

Argynnis aglaia (Dark Green Fritillary): Fairly common throughout July. Woolbury Ring.

Argynnis cydippe (High Brown Fritillary): None in 1951 and one late in July 1952. Farley Mount.

Argynnis euphrosyne (Pearl-bordered Fritillary): Extremely common in May and June 1951 in Crab Wood. Rare in 1952.

- Argynnis selene* (Small Pearl-bordered Fritillary): Common but later than the previous species in 1951. Rather less in 1952. None recorded prior to 1949. Crab Wood.
- Euphydryas aurinia* (Marsh Fritillary): Extremely common May-June 1951 in Hills Valley. Upwards of seventy emerging on evening of 26th May. Very few and much earlier in 1952; batch of twenty seen emerging 10th May in one locality.
- Melanargia galathea* (Marbled White): Very common in both years, June-July. Hills Valley.
- Eumenis semele* (Grayling): Common in both years, July-August. Woolbury Ring and Farley Mount.
- Pararge aegeria* (Speckled Wood): Common in all woods from May to August both years.
- Pararge megera* (Wall Brown): Commoner in 1952 than 1951. July and August at Farley Mount.
- Maniola jurtina* (Meadow Brown): In 1951 exceedingly common from July to early September. In 1952 first observed 10th June. Abundant from 24th June but scarce by mid-August. Hills Valley.
- Maniola tithonus* (Gatekeeper): Not very common in 1951. Much more plentiful in 1952 during July and early August. Crab Wood, Farley Mount, Woolbury Ring.
- Aphantopus hyperantus* (Ringlet): In 1951 common June and July. Rarer in 1952 and only found in July. Crab Wood and River area.
- Coenonympha pamphilus* (Small Heath): Exceedingly common from May onwards. A few flying in October in both years. Hills Valley.
- Thecla betulae* (Brown Hairstreak): One possibly seen on 22nd and 23rd July 1952 in Crab Wood.

(To be continued)

Microlepidoptera in Cheshire and South Lancashire in 1952

By H. N. MICHAELIS.

In spite of poor weather in the spring and summer of 1952 a few species new to the county records were found and some useful confirmations of old existing records were received.

Pyralis glaucinalis L. This species is considered scarce with us. Several were observed at Lymm, Cheshire, in July by E. Liddle.

Phalonia sabulicola Wals. Not previously recorded for Cheshire, two specimens were taken on Wirral by C. M. Jones, one near a patch of *Inula dysenterica* at Hoylake on 9.vii.52, the other at Birkenhead on 30.vii.52. The published food-plants are *Erigeron acris* and *E. canadensis*. So far I have not been able to ascertain if these plants grow on Wirral. Mr J. D. Bradley of the British Museum has kindly identified the specimens.

Cacoecia pronubana Hb. A specimen was taken at light in 1936 by C. M. Jones. I can find no record of this species from the north of England. As no other specimens have been observed, it may have been imported on growing plants from the south of England.

Bactra scirpicolana Pierce and Metcalfe. Larvae were plentiful in the lower parts of the stems of *Scirpus maritimus* on the Dee salt-marshes in early June. Retarded growth and yellowish tips of the grass usually indicate the presence of larvae. The larvae is found in the stem mainly at ground level or even below ground and pupates in a strong white silk cocoon in its feeding place.

Gelechia fumatella Doug. Not recorded for Lancashire, two specimens were "smoked" from overhanging banks on the sandhills at Freshfield on 18.viii.52. Apparently the food-plant is unknown. The last record for Cheshire was from Wallasey by C. S. Gregson prior to 1885. Mr. Bradley has kindly identified the specimens.

Sophronia semicostella Schiff. The last Lancashire record I can find, is "Manchester District" in Stainton's *Manual*. Two specimens were taken flying over grass (mainly *Dactylis glomerata*) at sunset on 3.vii.52, near the River Mersey at Didsbury.

Oecophora geoffrella L. Always considered an uncommon species in Cheshire, a specimen was taken in early June by W. D. Hincks at Burton. This species has also been observed on Wirral by B. B. Snell.

Borkhausenia subaquilella Staint. The imagines are fairly common in May and June on the moors between Disley and Macclesfield in Cheshire. They are most easily seen on walls though a few have been found resting on stones and tree stumps on the moorland. The early stages and food are not given in Ford's *Guide* and are presumably unknown. An unsuccessful search was made for the pupa-case when a moth was found drying its wings at 1600 hours on 25.v.52. Immediately below the moth was a small pocket of dry and decaying bilberry leaves and vegetable refuse at the foot of the wall. An old bird's nest taken nearby produced only *Monopis rusticella* Hueb. Other British species of *Borkhausenia* feed on decayed or dried vegetable matter, dead wood and bark, and wool, skins, frass, etc.

Coleophora virgaureae Staint. This species, which has been overlooked in the past, is described in the revised Ellis *List* as "very local, not recorded since 1890". Recently it has been found in several parts of Cheshire. A large number of larvae were found at Delamere in early October 1951 feeding on the seeds of *Solidago virgaurea*. These were placed with the cut food in a large box covered with a sheet of glass and kept outside throughout the winter. In early November the larvae hibernated in their cases on the dried food-plant and the sides of the box. On 23.iv.52 the larvae in their cases commenced to move about the box and part of the dead food-plant was transferred to an airy cage exposed to the morning sun. These larvae wandered about the cage for several weeks without noticeably feeding. In early June they began to settle down for pupation and no movement was observed after 16th June. A large number of moths emerged from mid-August to mid-September. The remaining larvae were left in the original box in which they had wintered, and were screened from the sun. A large number were still wandering over the food and sides of the box on 28th June and movement ceased in early July. Only a few moths emerged from this box and a large number of cases examined later were found to contain dead larvae. In May a dozen cases were brought indoors in a glass tube. The larvae were active until mid-June and then remained still. An examination of these cases showed that none of the larvae had been able to pupate. It would appear that some sunshine is necessary to

enable the larvae to settle down and pupate, otherwise they will wander until exhausted. The larvae were not observed to feed after hibernation in any of the three cases.

Stigmella (Nepticula) decentella H.S. This insect was recorded for Cheshire by A. W. Boyd who found it resting on Sycamore trunks at Frandley on 9.vi.47. Two specimens were taken at Caldy, Wirral, in early June 1952. Later in the month cocoons which are presumed to be this species were found on Sycamore trunks at Marple in Cheshire and at Heaton Mersey and Didsbury in Lancashire. Unfortunately these cocoons were either empty or produced parasites. It is possible that this moth is more widespread than we realise and may have been overlooked. We have as precedent for this conjecture two species which were considered scarce a few years ago, namely *Lithocolletis geniculella* Rag. and *L. anderidae* Fletcher. The former is found in most places in Cheshire where Sycamore grows and the latter is common as a larva in leaves of dwarf birch on most of our local heaths and mosses.

Blastobasis lignea Wals. This species was previously recorded only from the Grange and Witherslack districts where it was first taken by the late A. E. Wright in 1918. In August 1952 C. M. Jones took a few specimens at Hoylake, Cheshire, which is fifty miles south of the former locality. I am again indebted to Mr. Bradley for confirming my identification.

A Hybrid Swallowtail

AN ACCOUNT OF THE "CROSS" *Papilio asterias* ♀ (NORTH AMERICAN BLACK SWALLOWTAIL) × *Papilio machaon* ♂ (THE SWALLOWTAIL, OF EUROPEAN—MALTA-STOCK) AND A NOTE ON THE "machao complex" OF THE NORTH AMERICAN CONTINENT.

By C. A. CLARKE, M.A., M.D., F.R.C.P., F.R.E.S., and
J. P. KNUDSEN, M.Sc., B.Sc.

On 12th September 1952 one of us (C.A.C.) had the good fortune to receive from the other (J.P.K.) eight pupae of *P. asterias* bred in Georgia. On arrival in England the pupae were incubated at 70° F. and two female butterflies soon emerged, the first on 14th September and the second on 30th September. The remaining six pupae appear to be over-wintering in the chrysalis state and the insects have so far shown no sign of emerging (2nd January 1953).

On 5th October 1952 the second female was successfully hand-mated (1) (C.A.C.) with a male *P. machaon* of Malta stock which had emerged the previous day. The mating appeared to be in every way normal, the butterflies remaining together for about an hour. On 8th October the female started to lay on fennel growing in an unheated greenhouse and during the next seven days she laid over a hundred eggs, almost the entire stock being fertile. About eighty of the eggs were kept in Cheshire (C.A.C.), eighteen were sent back to North America (J.P.K.) and fifteen were sent to Dr. P. M. Sheppard of the Zoological Department, University of Oxford. Each of us bred the early stages at a temperature of about 70° F. In the Cheshire portion the eggs started to hatch in five days (13th October), the first larvae pupated fifteen days later (28th October), and the hybrid butterflies started to emerge on

10th November, the complete cycle from egg to perfect insect taking only thirty-three days.

From the Cheshire brood (C.A.C.) fifty-six pupae were bred from eighty-six larvae: thirty larvae, mostly from the second half of the brood, died of typical virus disease. The American fraction (J.P.K.) produced thirteen pupae from fifteen eggs, and Dr. Sheppard fourteen pupae from sixteen eggs, two failing to hatch. When the hybrids emerged there was at first a marked male preponderance but later the sex ratio became more evenly balanced. By 2nd January 1953, thirty-six males and twenty-one females had emerged but the final record will not be available until later as some of the pupae have been taken from the incubator and will not emerge until the spring.

Description of the Hybrid.

(a) Early stages.

It is well recognized that the eggs, larvae and pupae, of *asterias* and *machaon* are very similar. The chief difference noticed from breeding both butterflies (J.P.K.) is that in the last two instars the bright orange spots in *machaon* are yellow or yellow-orange in *asterias*. In the hybrid the spots were orange and the larvae appeared to be identical at every stage with *machaon* (C.A.C., J.P.K. and P.M.S.). The smell and taste (P.M.S.) of the secretion from osmateria were also observed to be the same as in *machaon*.

The Cheshire and Oxford batches of larvae were fed entirely on fennel and the North American on wild carrot: both foodplants are common to both parent species. The hybrid pupae showed the brown and green variation characteristic of the parent forms.

(b) Hybrid butterflies.

The striking feature of the hybrid butterflies was the marked resemblance both in the male and the female to P. asterias: in particular, the bodies were identical. We had expected in the F1 generation to obtain a form intermediate between *asterias* and *machaon* and we were much surprised to find that at first glance there did not appear to be any resemblance to *machaon* at all (see Plates). Because of this it was suggested that the butterflies might not be hybrids, but simply an example of sporadic parthenogenesis—the foreign spermatozoa acting as a non-specific stimulus to cell division in the female.

However, more detailed examination of the insects in North America (J.P.K.) where they were compared with a large number of type forms showed that *machaon* influences were quite definitely present and that the butterflies were in fact true hybrids. The differences are most marked on the undersides (Plates V, VI and VIII) and the important *machaon* features are in the anal angle spot (see diagram and Plate IX), and in the partially yellow legs.

Details of Differences between the Male Hybrid and the Type Male asterias.

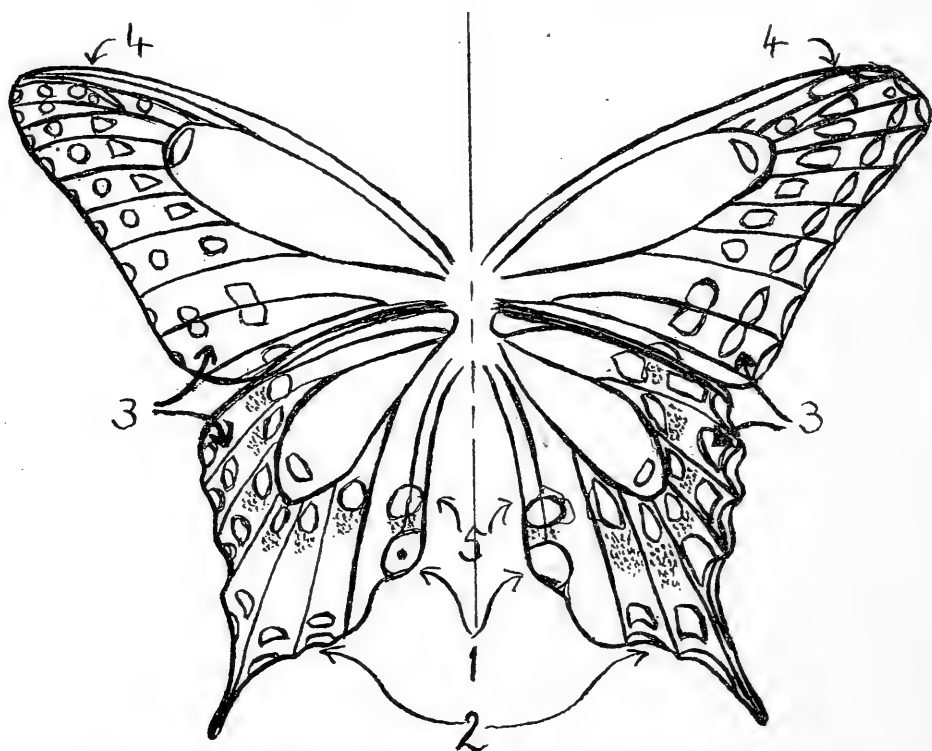
(A) Upper surface (Plates V and VII).

The resemblance to *asterias* is nearly perfect except (a) the red spot in the anal angle of the hindwing of *asterias* is small and always has a black central pupil, while in the hybrid the red spot is larger and has the black below the red and elongated to a dash.

(b) The median band of yellow spots which crosses the central area of both wings is closer to the margin in the hybrid.

(B) Under surface. (See Plates V and VIII, also diagram. The numbers in the text correspond with those on the diagram).

(1) There is again a real difference in the size and shape of the anal angle spot. In *asterias* it is small and has a black central pupil. In the hybrid it is larger and the black pupil has dropped down to the bottom of the spot and become a dash instead of a dot. There is a slight



Typical male *asterias* underside. Drawn from a series of nine specimens from the south-eastern United States.

Typical male hybrid underside (♂ *machaon* × ♀ *asterias*.) Drawn from a series of four specimens.

colour difference as well, the spot being redder in *asterias*. In the hybrid the colour matches *machaon*—and indeed the form of the spot is typical of *machaon*.

(2) The yellow markings between the wing veins at the very margin of the wings are more prominent in the hybrids. There they form a very narrow yellow border interrupted only by the tips of the veins and in this they resemble *machaon*. In *asterias* the yellow markings cover only about half the space between the wing veins.

(3) In the hybrids the sub-marginal row of spots on the forewing is much enlarged, the spots being almost confluent dashes separated only

by the wing veins. Moreover, on the forewing the spots in the hybrid are yellow with only the slightest trace of orange in the bottom spot or two. In *asterias* the corresponding spots are round and well separated and an orange tone appears in the lower two or three spots. On the hindwings the sub-marginal row of spots is also enlarged in the hybrid and there is a colour difference as well. In *asterias* the four spots above the tail are orange with at most a thin yellow border top and bottom. In the hybrids these spots are yellow with at most a narrow orange dash in the centre of the top one or two spots; in this they veer towards *machaon*.

(4) A hazy yellow spot appears at the apex of the forewing in the hybrids which is present in *machaon* but not in *asterias*. In the hybrid the spot below this hazy one is tear-shaped while in *asterias* the corresponding mark is more like a comma.

(5) The median yellow band is shifted toward the outer margins of the wings in the hybrid and is much yellower than it is in *asterias*. The effect of this is to make the blue region between the median and submarginal spots much more narrow in the hybrids. Further, in the hybrid there is much more blue in this area as a rule than in *asterias* (this is shown in the diagram, where the black speckles represent blue scales).

Details of Differences between the Female Hybrid and the Type Female asterias.

(A) Upper surface (Plates IV, VII).

No difference was detected, except in the character of the anal spot which is similar to that in the male hybrid.

(B) Under surface (Plates VI, VIII).

The differences here are the same as those in the male hybrid, the undersides of both male and female being identical.

Genetics.

No attempt is being made here to speculate on the genetics governing the above differences. The next step would seem to be to try to obtain the reciprocal "cross" *P. asterias* ♂ × *P. machaon* ♀ and also to find out if the original hybrid can readily be obtained again.*

Fertility.

No difficulty was experienced in hand-mating the hybrids among themselves nor with type *machaon* and type *asterias* males or females (see Plate X). Dr. Sheppard obtained eighty eggs from an inter-hybrid mating but these collapsed and were all infertile. From all the other matings (C.A.C. and J.P.K.) no eggs have resulted, although section of bodies after death showed that eggs were present.

DISCUSSION.

There exists in the North American continent a large group of *machaon*-like butterflies of which *Papilio machaon* is regarded as the type. Holland (4) considers that the group originated in the New World and that *P. machaon* spread westward into Asia and Europe.

At the present time *P. machaon* is found as a rare butterfly in the far north of the North American continent—in Alaska, the Hudson Bay

*Both these have since been done.

area and the north side of Lake Superior, where it occurs as two arctic subspecies.

The common Swallowtail of North America is *P. asterias*. This insect occurs from Manitoba, Canada, in the north, to Arizona, in the south, keeping east of the Rockies in its entire range, except in the extreme south.

The two butterflies have, therefore, some common ground in the far north but whether there is much intermingling is doubtful since *P. machaon* is there such a scarce insect.

West of the Rockies *P. asterias* is replaced mainly by two forms, *P. bairdii* in the Pacific north-west and *P. zelicaon* in the south-west. These and other smaller groups appear to be intermediate in wing pattern between *asterias* and *machaon* and it is possible to trace a series between the two butterflies using these intermediates to bridge the gap.

As far as wing pattern is concerned *P. asterias* and *P. machaon* appear to be at opposite ends of a geographical cline. The fact that we have been able to cross them makes it likely that further hybrids can be obtained between the intermediates themselves and between them and the extreme forms. Some of these might be fertile and in any case further information would probably be obtained as to the relationship of the forms found in Nature. In this connection we think our hybrid shows many resemblances to *P. bairdii*. The probable infertility of our hybrid also supports the view that *P. machaon* and *P. asterias* are two distinct species.

SUMMARY.

(1) The hybrid *P. asterias* ♀ × *P. machaon* ♂ obtained in captivity is described.

(2) The "*machaon* complex" of the North American continent is briefly discussed and lines of further work indicated.

FOOTNOTE.

Since writing the paper Dr. E. A. Cockayne has pointed out that this is not the first occasion on which the hybrid has been obtained. In 1908 Mr. Cecil Floersheim (2 and 3) achieved a "natural" mating in his butterfly house between a *P. asterias* ♀ and a *P. machaon* ♂. The larvae from the "cross" thrived, but unfortunately most of the pupae died due to overheating. The three butterflies which did emerge were all males and he noted the marked resemblance to *asterias*, concluding that *asterias* was a Mendelian dominant to *machaon*. No detailed description of the hybrids was given.

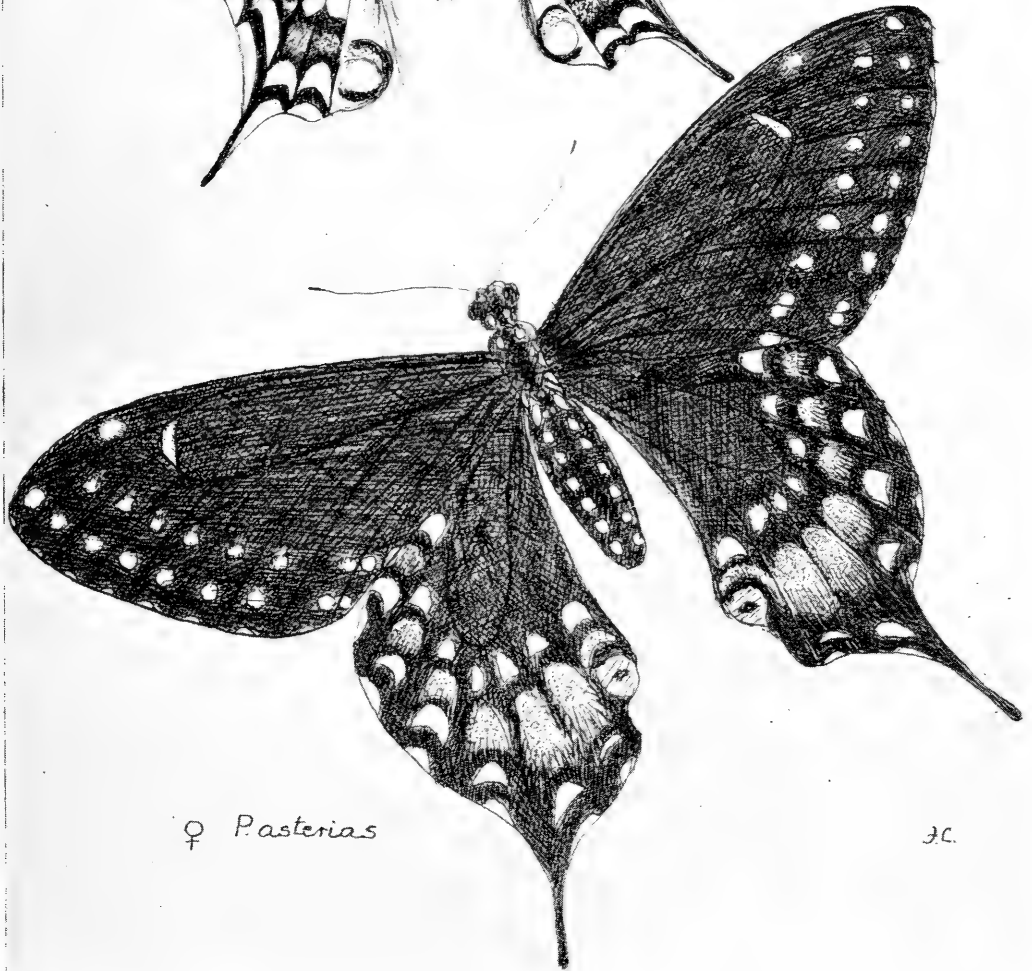
Mr. Floersheim also had the idea of mating *zelicaon* with *machaon* but failed as the times of the emergence of the butterflies from the pupae which he had did not coincide. He was also never able to repeat the original experiment nor to obtain the reciprocal "cross", ♀ *P. machaon* × ♂ *P. asterias*.

REFERENCES.

1. Clarke, C. A., (1952). *Ent. Rec. and Journ. of Var.*, **64**, p. 98
2. Floersheim Cecil, (1910) *Ent. Rec. and Journ. of Var.*, **22**, p. 200
3. Floersheim, Cecil. (1915). *Entomologist*, **48**, pp. 225, 253 and 275
4. Holland, W. J., (1931). *The Butterfly Book*. Doubleday, Doran & Co., New York, p. 313 et seq.



♂ *P. machaon*

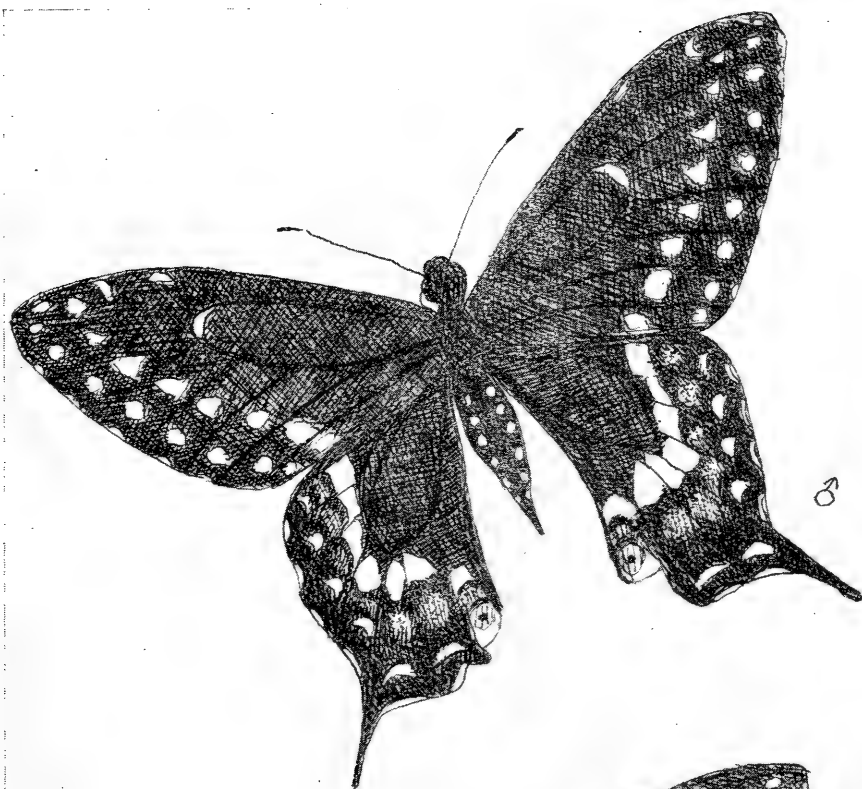


♀ *P. asterias*

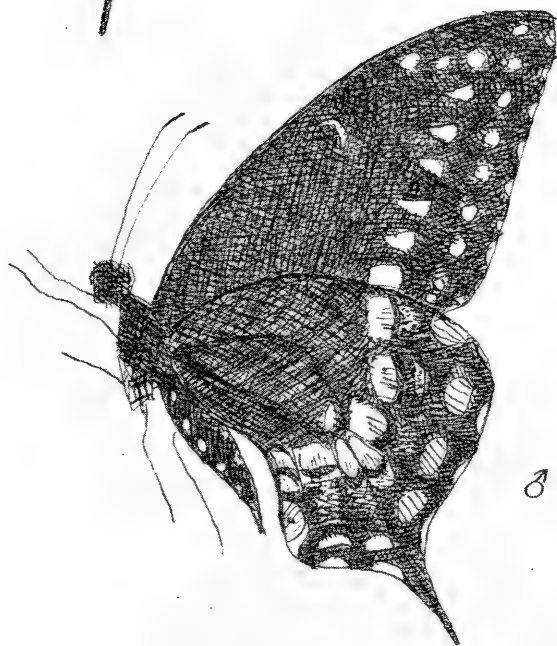
J.C.

(The alar expanse of the ♂ *P. machaon* is 3.0 in. and of the ♀ *P. asterias* 3.75 in.)

PLATE V.



♂ *P. asterias*



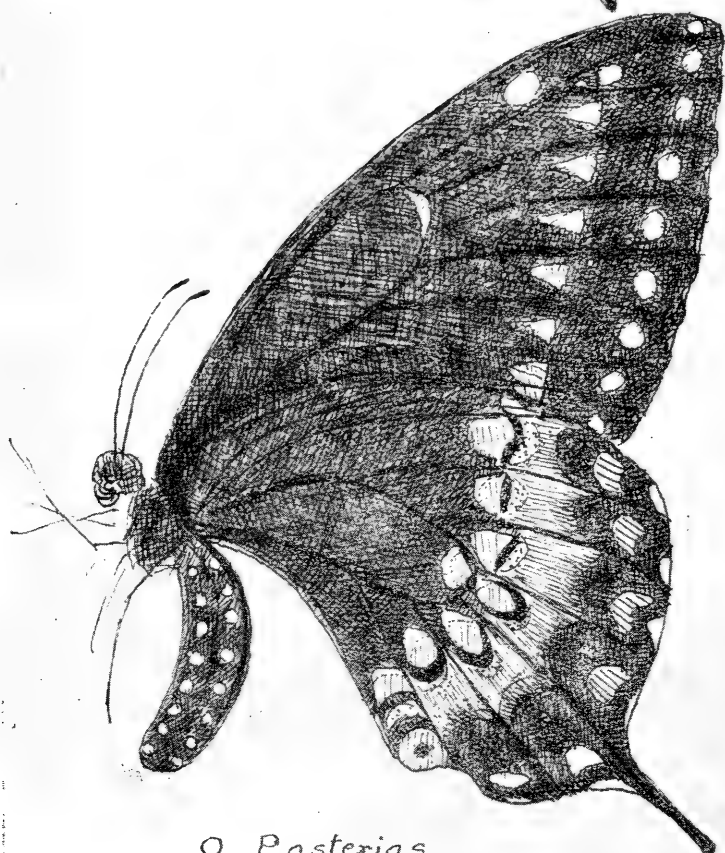
♂ *P. asterias*
underside

J.C.

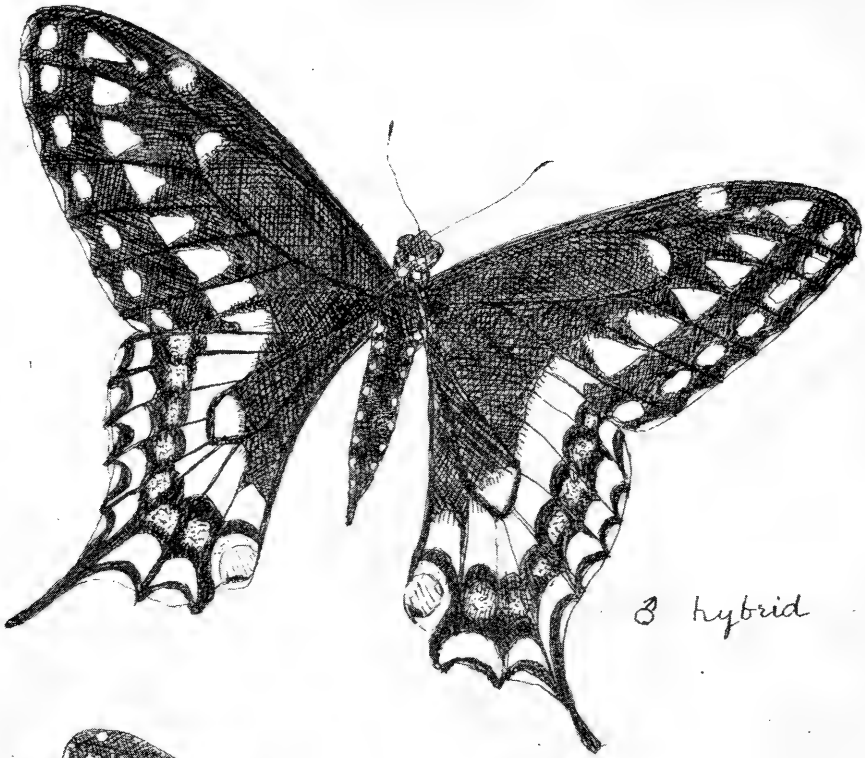
(The alar expanse of the ♂ *P. asterias* is 2.75 in.)



♂ *P. machaon*
underside



♀ *Pasterias*
underside



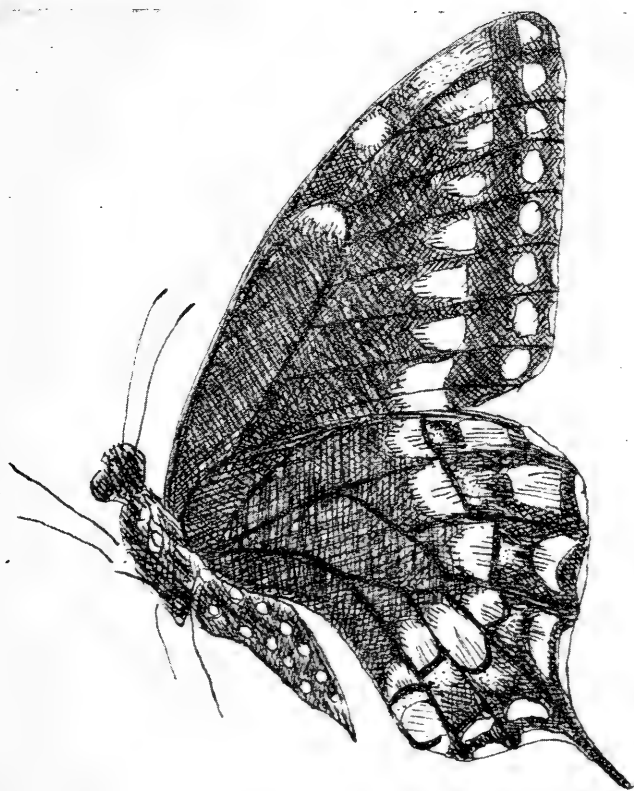
♂ hybrid



♀ hybrid

HC.

(The alar expanse of the ♂ and ♀ hybrids ranges from 3.0 in. to 3.5 in.)



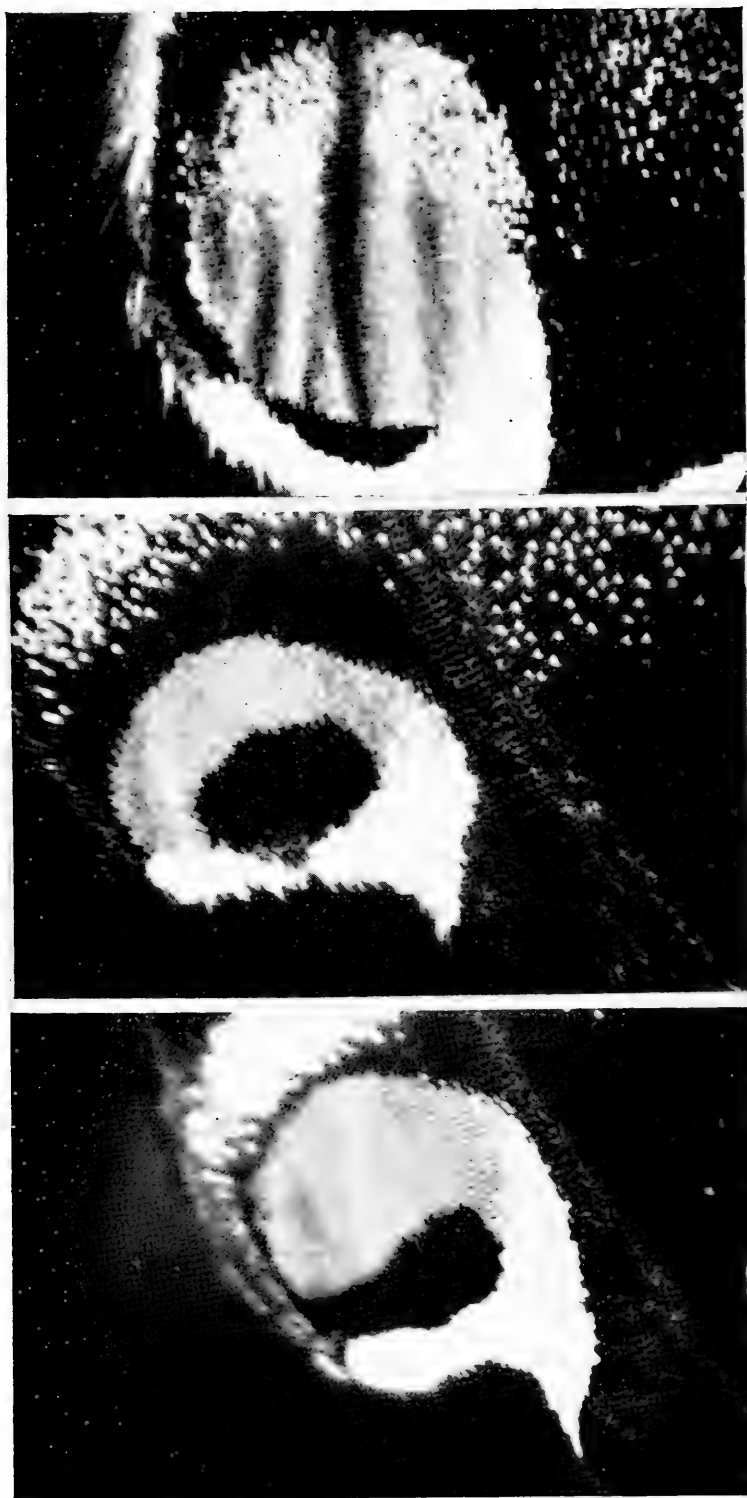
♂ hybrid
underside



♀ hybrid
underside

J.C.

PLATE IX.

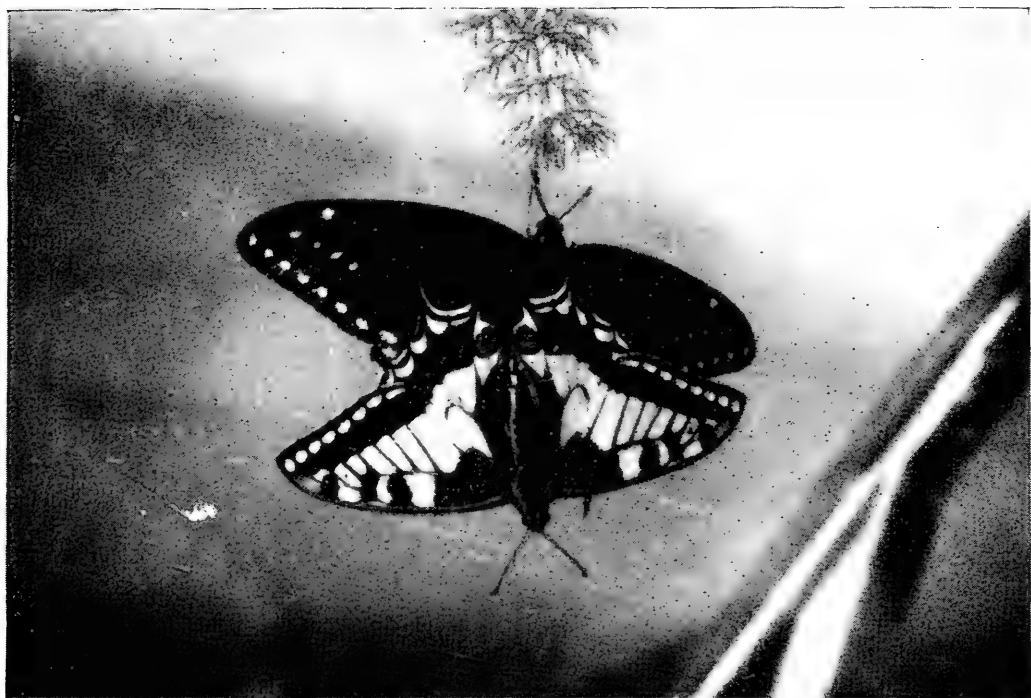


Above : *P. machaon*. The pupil of the anal spot is dropped right to the bottom of the spot.

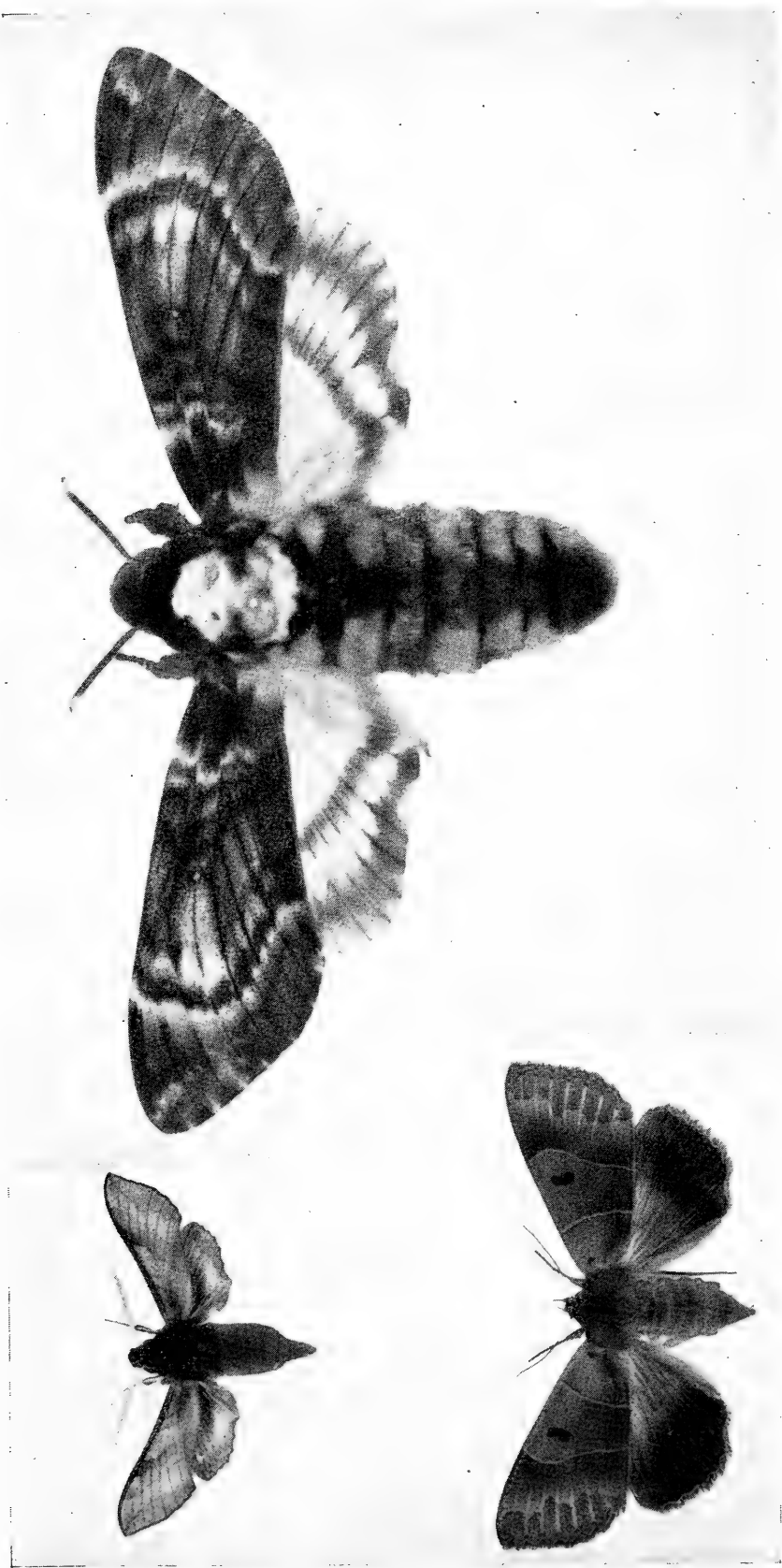
Middle : *P. asterias*. The pupil of the anal spot in the type. As can be seen, it is nearly in the centre of the spot.

Below : Hybrid. Showing the striking intermediate position of the pupil, but resembling *machaon* more than *asterias*.

(The magnification is $\times 10$)



♀ hybrids mating with ♂ *machaon*.



Aberrations of British Macrolepidoptera

By E. A. COCKAYNE, D.M., F.R.C.P.

PLATE XI.

[The following aberrations are in the Rothschild-Cockayne-Kettlewell collection in the British Museum.]

Acherontia atropos Linnaeus ab. **radiata** ab. nov.

On the forewing there is a complete blackish fascia, which lies internal to the whitish fascia seen clearly in ab. *virgata* Tutt. This blackish fascia is bordered on its outer side by a whitish fascia tinged with rufous externally and then there is an indistinct dark fascia; from the discoidal spot two broad pale rays tinged with rufous run to the dark fascia, and the interneural spaces between 1 and 2, 2 and 3, and 3 and 4, are paler than usual giving a rayed effect; the transverse lines at the base are more distinct than usual. The black bands on the hindwing are paler than normal. The death's head on the thorax is unusually white.

Type ♀: From the collection of W. Simmonds of York about 1870. (Willoughby Ellis coll.) Cockayne coll.

Acherontia atropos Linnaeus ab. **pulverata** ab. nov.

The forewing is dark. The hindwing is powdered with black scales except on the costa, at the base, and on the inner margin.

Type ♂: Wells, Norfolk, 10.x.1950, bred by R. G. Todd.

Allotype ♀: Eastbourne, 1902, Earp. Rothschild coll.

Paratype ♀: Loc. incog. (Bright coll.) Rothschild coll.

Deilephila porcellus Linnaeus ab. **decolor** ab. nov.

On the forewing the costa and fringe are deep pink; the other parts of the wing, which are usually deep pink, are whitish with a slight pink tint; the parts usually greenish yellow are very pale, whitish with a faint tint of greenish yellow; the base and median area are greyish. On the hindwing the base and costal area are dark as in the normal form; the median area is whitish with a yellowish tint, and the border is greyish white with a faint pink tint. The fringe is deep pink. The thorax and abdomen are of the usual deep pink colour.

Type ♂: Sandwich, bred 1880, W. H. Tugwell. Rothschild coll.

Hemaris tityus Linnaeus ab. **flavescens** ab. nov.

On both the fore and hindwing all the parts which are normally dark are orange brown. The hair on the first two abdominal somites is browner than usual, and the black hairs on the middle somites are brown.

Type ♀: New Forest, 13.v.1895, G. H. Conquest. (Bright coll.) Rothschild coll.

Minucia lunaris Schiff. ab. **radiata** ab. nov.

The forewing is normal except that from the subterminal line to the row of black dots near the margin there is a pale line along each of the nervures (seven in all); the hindwing is normal.

Type ♀: Ham Street, Kent, 7.vi.1949. Bred by E. A. Cockayne from a pupa handed over by Dr. H. B. D. Kettlewell probably from a wild larva.

EXPLANATION OF PLATE XI.

Fig. 1. *Acherontia atropos* ab. **radiata** ♀ Type.

Fig. 2. *Deilephila porcellus* ab. **decolor** ♂ Type.

Fig. 3. *Minucia lunaris* ab. **radiata** ♀ Type.

Haworth and his *Prodromus*. I

By P. B. M. ALLAN.

When Stainton referred to "the revolution that has been caused in our cabinets by rare Noctuae being taken in abundance at sugar" he understated the case. It was not only "in our cabinets" that the revolution occurred: it swept through the entire province of lepidopterology. It revealed the range and distribution of most of the Agrotidae throughout our island and so, gradually, throughout the world; it enabled field workers to obtain the eggs and rear the hitherto undiscovered larvae of many species and so to study and describe the unknown stages; it provided the taxonomist with additional and plentiful material for the study of insect evolution and variation; it furnished the ecologist with data, the zoogeographer with information essential to his work, the biologist with matter for his investigation of life-histories. It was indeed a revolution.

One has only to read the descriptions of Noctuae given by all our entomological writers prior to 1800 to realise the immediate result of this method of catching moths. Species hitherto regarded as of the first rarity, or of which only one or two specimens were known to exist in collections, were found to be quite common. When Haworth wrote his second book (1803), *Amathes c-nigrum* L., that lovely pest of the autumn sugarer, was "rare"; of *Diarsia brunnea* Schf. he knew of only two specimens; of *Agrotis puta* Hüb. he writes "I have just seen a female specimen of this, which was taken yesterday in St. James's Park: am now acquainted with it in at least five cabinets" (elsewhere he tells us that he has examined not less than 70 collections) "and possess it myself". *Cirrhia gilvago* Schf. was "very rare indeed" and so were *Anaplectoides prasina* Schf. and *Amphipyra tragopoginis* Clerck. *Aporophyla lutulenta* Schf. was known to Haworth by a single specimen "taken once by my great friend D. Jones, time and place not known."

It is, of course, difficult to find the larvae of many species which feed on low-growing plants—and this generalization includes most of the Agrotidae—and although the rearing of larvae was practised from the early days of Entomology I do not recall any mention of searching food-plants *at night*. Haworth records the larvae of nearly all the species which feed on deciduous trees and shrubs, quoting the descriptions of Villers, Fabricius, Linné and other masters, because, says he in his Preface to the *Lepidoptera Britannica*, "my own notes on those two points" (larva and pupa) "were not so full as I could wish, and chiefly made before I had conceived an idea of submitting them to the inspection of the public". But it is remarkable that with the exceptions of the Cuculliinae and the genus *Orthosia*, and one or two of the stem-feeders such as *Nonagria typhae* Thun., he knew the foodplants of only those Agrotidae which feed on trees and shrubs, that is to say of those species which remain on the foodplant during the day.

Reading the *Lepidoptera Britannica* one, therefore, gains the impression that Haworth was not greatly interested in the earlier stages of the Lepidoptera. But this impression, I feel sure, is a false one. His lack of attention to the early stages was largely due to the fact that he was equally interested in botany and birds: indeed, he himself records this in his Preface. So that although he had "diligently examined many

parts of England personally" his expeditions were all made with a view to obtaining plants and noting birds no less than catching and observing Lepidoptera. It was this consideration which restricted his field work, not any deficiency of his powers of research and observation. He seems to have aimed at covering as much ground as possible on each expedition—in one summer alone, he tells us, he travelled "not fewer than a thousand miles". Thus to search diligently for larvae was beyond the compass of his time.

So one is not surprised to read in his *magnum opus* that the larvae of *Lasiocampa quercus* L. and *Notodonta dromedarius* L. feed on oak, that *Cerura vinula* L. is to be found only on white willow and *Scoliopteryx libatrix* L. on poplar. Had he searched aspen and birch assiduously he would hardly have recorded that *Notodonta ziczac* L. and *N. dromedarius* were of very infrequent occurrence nor that the larva of the last-named is to be found only in September. He does not seem to have practised pupa-digging, for although he tells us that the pupa of *Gripesia aprilina* L. is usually to be had "by digging about the roots of oak an inch deep" he makes no mention of the pupae of the other species which one invariably comes across when collecting *aprilina* in this way.

Yet such were his enthusiasm and diligence that had he devoted the whole of his time to the Lepidoptera he would have ranked far higher on the roll of English lepidopterists than he does to-day. Paradoxically it was his avid thirst for knowledge which hindered the progress of his learning. He ranks with Newman rather than with Tutt, though he was a greater man than Newman; for his was the keener, analytical, brain. Tutt was too dynamic to be classed with anyone: yet in the sphere of taxonomy, when one considers the limited material at his disposal, the almost primitive state of the entomological knowledge of his day, Haworth was no lesser man. Be it always remembered that Haworth worked alone, Tutt in keen competition with many.

There was a world of difference between the two men. Haworth sought to increase scientific knowledge by gathering and recording his fellow-workers' unprinted observations no less than his own and thereby to provide a working tool for his brother lepidopterists; to make available to English workers the knowledge promulgated by the great Continental authorities; to import order and system into the study of Lepidoptera in this country. Tutt set out to sweep away inherited notions, to teach his fellow lepidopterists and show them the road along which they must travel. If he pointed that road assiduously, and, it must be added, vehemently, it was because he *knew* it to be the only road to salvation and that all those who failed to tread it were doomed to remain in the outer darkness. Being a schoolmaster he was accustomed to teach and he had little patience with lesser men who had the temerity to differ from him. The antithesis between the two men could not have been more total. Haworth, a clubman, fond of entertaining and of being entertained, therefore delighting in the society of loved and loving friends; Tutt, ceaselessly working, counting all hours wasted which were not devoted to work, a spiritual solitary, as indeed all geniuses are; for there is no doubt at all about the genius which illumined him. Both men achieved great things; both had great influence

on the entomologists of their generations; and both are beacons in the progress of our science.

These thoughts have been evoked by the appearance of a new edition of Haworth's first book which has recently been produced by Mr. ERIC W. CLASSEY. It is a slender quarto titled *Prodromus Lepidopterorum Britannicorum. A Concise Catalogue of British Lepidopterous Insects with the Times and Places of Appearance in the Winged State.*—By a Fellow of the Linnaean Society. The original edition was printed in 1802 at the little market town of Holt in Norfolk, where Haworth had a small estate.

Very wisely Mr. Classey has produced his edition by the photo-litho process, each page of the original having been photographed and then reproduced the exact size. Thus the new edition is a perfect facsimile of the original and at a glance can be distinguished from it only by the paper upon which it is printed. (The original is printed on a 'laid' paper, the wire-marks being horizontal, watermarked 'I. Furness & Co. 1801'; the new edition is on a thin super-calendered wove). All entomologists who collect the English classic books on their subject or are interested in them, and all professional librarians, will therefore be grateful for this new edition, since their chance of acquiring a copy of the original is extremely remote. How many copies were produced in that little printing-house at Holt just a hundred and fifty years ago is unknown; but seeing that Haworth mentions elsewhere that the cabinets of his friends and acquaintances amounted to only 70 it is unlikely that the edition exceeded two hundred copies. And like all books which are 'working tools' most of these copies were 'thumbed to pieces' and have long since found their way into the dust-bin.

Next month, with the Editor's permission, I hope to say something about the contents of this most interesting volume.

(To be continued).

Current Notes

On another page we print a note about E. F. Johns and his Winton House preparatory school at Winchester, where the boys seem to have been *taught* Entomology. The Bible tells us that "There is no new thing under the sun," but we have never before heard of a school where the services of an expert were enlisted to teach the pupils how to set Lepidoptera. The note also refers to a remarkable aberration of *Anthocharis cardamines* L. Does any reader of this magazine by chance possess this specimen? The "pin-holes" in the wings, to which Mr. Castle Russell refers, should be sufficient to identify it.

In our January number we printed a Note (page 25) by Dr. A. M. R. Heron on the destruction of British scenery by the continual mass-planting of conifers. A book we have recently read contains the following: it concerns the activities of the Forestry Commissioners in one part (only) of Wales. "The Corsican pine (*Pinus nigra* var. *calabrica*) is . . . fairly popular in economic forestry . . . Here the pines are mixed with noble firs (*Abies nobilis*) and the two redwoods (*Sequoia gigantea* and *S. sempervirens*). Strong natural regeneration of the pines and firs can be seen in the vicinity. The American lodgepole pine

(*Pinus contorta*) has already been planted . . . and is to be used more extensively in future. . . . The hemlock spruces (*Tsuga* spp.) . . . will be seen along the valley, where they have been used for marginal effect. Cypresses and thuyas . . . recall the cemetery rather than the forest to the ordinary observer, but both groups give good timber. *Thuja gigantea* has been used on a plantation scale . . . and Lawson's cypress (*Chamaecyparis lawsoniana*) is also to be seen. . . ."

'Cemetery' trees: to mark the graveyard of our hopes for British scenery?

Our correspondent D. G. SEVASTOPULO writes:—"When I was in England last year I got a female *P. fuliginosa*. I brought larvae from her to Uganda in mid-September and have just had the fourth generation emerge. I was interested to see if the warmth here would produce any tendency towards the Southern European form with the redder hindwings, but so far each generation has been like its predecessor. What very tough larvae they are, far tougher than any of the local *Spilosoma* species. I feed them on a tree groundsel, cuttings of which I brought back from the Kenya Highlands, and never have a casualty, whilst the locals seem very subject to intestinal complaints. I shall let you have an account of the experiment when I have got to the sixth generation, say about the end of April." We await our correspondent's paper with interest.

As we go to press we learn that the famous Castle Russell collection of aberrations of British butterflies has been acquired for the Rothschild-Cockayne-Kettlewell Collection at Tring. An announcement about this will appear in our next issue.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Phalonia rupicola Curt. The larva of this rather pretty Tortrix may be found in the fallen broken stems of *Eupatorium cannabinum* in March and early April before the rising new growth tends to cover them. The pieces should be kept out of doors exposed to the weather till the middle of June and the moth will then be bred easily. It can also be beaten out from the clumps of *Eupatorium* in July but is rather sluggish and difficult to dislodge without damage. *P. rupicola* is very common in the big clumps of *Eupatorium* that grow at the base of the cliffs at Kingsdown, Deal, just below the golf course.

Evetria posticana Zett. In early April side shoots of *Pinus sylvestris* should be scrutinised in young plantations with trees of, say, ten or twelve feet high for small central buds showing no sign of growth. If these are picked off they will often be found to contain a small black pupa which will produce in May *Evetria posticana*. The pupae require no care and may be dropped, of course inside the bud if possible, into a glass-lidded metal box, where the moths will emerge without difficulty in due time. The larva pupates head downwards, so the shining black top appears when the bud is broken off; too frequently, however, the cocoon of a parasite is found. *E. posticana*, formerly esteemed a local

and northern insect, is probably to be found to-day wherever there are young plantations of Scots fir.

Pammene trauniana Schiff. The little pink larva of this local Tortrix is to be found under the bark of maples in late March and early April. Although the moth has been taken in several places, by Purdey near Barham and also near Folkestone, by Elisha at Box Hill, by Machin and Mr. L. T. Ford at Bexley, and by the late Sir John Fryer at Chatteris, I believe the larva has so far been found only at Bexley and Chatteris, possibly because elsewhere it was not sought at the right time of the year. The larva is difficult to find but rather easy to rear; the bark should be stored out of doors with good drainage till the beginning of May, by which time pupation will have taken place and it can be transferred to the breeding-cage.

Hemimene alpestrana H.-S. The small white larva of this species may be found in roots of *Achillea ptarmica* (sneezewort) at the end of March. *H. alpestrana* is not at present known in Epping Forest, the locality in which it was originally discovered in this country; just before his death the discoverer, the late A. Thurnall, wrote to me that the place had been drained and the plant killed; but it is found at any rate near Limpsfield, near Southampton, and at Yarmouth, I. of W., and could probably be rediscovered at Epping.

As the plant is rather difficult to spot in the spring it is as well to mark it down in the previous summer or autumn. The roots should be potted up and the moths will emerge in late June. They are difficult to get in any quantity as larvae, and beasts to catch in the adult state, for they appear to move only in the brilliant sun and even then cannot be beaten out in any way as they drop at the slightest alarm. My late friend, William Fassnidge, and I got a good series each near Southampton on a sunny day by watching them run up a stem and then putting the net below and tapping them smartly into it.

Practical Hints

The *Xylocampa areola* ♀♀ which one finds at rest on farm gates and gate-posts and fences, and occasionally on tree-trunks (where they are painfully conspicuous) during April often lay eggs at dusk on the day of capture. The larvae are not difficult to rear—provided one has access to plenty of honeysuckle. Snowberry is not, in our experience, a satisfactory substitute, though the larvae can sometimes be kept alive on it for a day or two in an emergency. These slender brown larvae remain on the stems of the honeysuckle by day.

Those who put a ♀ *Lycia hirtaria* into an assembling-cage should not give up hope too soon if the moth fails to attract a mate. On 14th April 1940 we found a female of this species who 'called' vigorously that night and every succeeding night; but it was not until the morning of 23rd April that a male was found outside her cage. He was put into the cage and at 9.40 p.m. (S.T.) the moths paired.

When rearing *Gastropacha quercifolia* for the first time do not be alarmed if the larvae awaken from hibernation before any leaves are on the foodplants. They feed at first on the unopened leaf-buds, and

as they eat the inside of the bud and usually leave the bracts intact, the novice is apt to be deceived and imagine that his larvae still have plenty of food to eat. The moral of this is to give fresh sprigs of black-thorn or hawthorn every day.

Eggs of all species which overwinter in this stage should be looked at daily now and so should all hibernating larvae. It is unwise to bring eggs indoors with a view to 'forcing' them, but many hibernating larvae such as the Burnet moths, *Leucoma salicis*, etc., can be brought into the house in April, if the weather is mild, as soon as they wake up (not before). Remember that if diapause is broken it cannot be renewed; see therefore that the temperature remains constant in the room in which you keep these larvae.

As soon as the weather becomes mild and the first signs of spring appear take your torch every evening and search the edges of fields, hedgerows, and suchlike places where larvae are gathered together. If you work industriously you will have all your cages full before the next issue of this magazine appears. There are ten larvae to be had now for every one available in May. The larvae of all the 'Brown' butterflies which feed on grasses (including *C. tullia*) are to be had, and so are *M. galathea* and *L. phlaeas*.

Notes and Observations

A NOTE ON ODONTOSIA CARMELITA ESPER.—Mr. H. Symes' article on the larval habits of this species (*Ent. Rec.*, 64: 337) reminds me of the following unrecorded observation. In 1947 my wife and I visited Southern Ireland in late June and early July with the object of beating the larva of *Leucodonta bicoloria* Schiff. at the late Colonel Donovan's two localities, which we had been given fairly accurately, to the south of Lake Killarney and outside Kenmare. A great deal of effort was expended, but we were entirely unsuccessful with that species. Both small and large birches were beaten, and both high and low. I did, however, obtain one larva of *O. carmelita* in the beating-tray. I beat it from the lowest and only accessible bough of a large birch on the south side of the lake and about half way along its length. On examining the bough I found that my stick had fallen exactly on the unmistakable scar of a past beating—obviously some years old. I hastened to examine other trees which I had beaten and in nearly every case I found beating scars. In view of the fact that Donovan recorded only two *carmelita* from Ireland and that he beat, I think I am right in saying, more than a dozen larvae of *bicoloria* (from memory I think 22), it would appear that this latter species must fluctuate in numbers from year to year. The *carmelita* pupated in due course and was alive a year and a half later but failed to hatch.—Dr. H. B. D. KETTLEWELL, c/o Post Office, Fish Hoek, Cape Town. 16.i.53.

EULIA FORMOSANA GEYER IN DORSET.—On 4th July 1950 whilst working light in my room at Sandbanks, Dorset, I noticed a very striking-looking 'micro' sitting on the wall of the room, and as it was unfamiliar to me I boxed and set it. I waded through 'Meyrick' in an attempt to discover the moth's identity, but no description came anywhere near

it. Last July I asked Mr. R. Prichard of Bebington, Cheshire, if he knew what the moth was. He did not. I gave it to him and in November he wrote to say that he had exhibited it at the annual exhibition of the Lancashire and Cheshire Entomological Society and that Mr. W. H. T. Tams, who was present, immediately recognised it as *Eulia formosana* Geyer. Mr. Tams had previously identified a specimen of the insect taken by Mr. R. W. Parfitt in Surrey in 1945, as described in *Entomologist*, lxxx (1947), p. 225, where a photograph of Mr. Parfitt's specimen is reproduced. Further specimens were taken by Mr. Parfitt in the same locality in 1946, and in *Entomologist*, lxxxii, p. 278, it is recorded from north-east Hampshire, where Mr. A. W. Richards took six at light.—F. M. B. CARR, Martin's Close, Mudeford, Christchurch.

DAY-FLYING HABIT OF *A. LUCERNEA*.—I was interested to read Mr. Alfred Hedges' note (page 16). On the 15th August last I noticed a number of large moths in fast flight over the cliffs on the north side of Canna near Compass Hill. One was netted and proved to be *A. lucerneae*. The day was fine and warm.—J. L. CAMPBELL, Isle of Canna, Scotland.

EUPITHECIA TANTILLARIA BOISD. IN DERBYSHIRE.—On 17th May 1952, in Derbyshire, I took a small 'pug' which, after setting, was put aside and temporarily overlooked. On examining this a few weeks ago I was convinced that it was a specimen of *Eupithecia tantillaria* Boisd. and submitted it to Mr. W. H. T. Tams of the British Museum, who kindly confirmed its identity.—T. H. FORD, 275 Derbyshire Lane, Sheffield, 8. 28.i.53.

EARLY MOTHS.—I found one *Phigalia pedaria* Fab. and four *Theria rupicaprararia* Schf. at an electric light on 28th January this year, at least three weeks earlier than last year.—J. H. JOHNSON, 53 Knighton Street, Hephthorne Lane, Chesterfield. 9.ii.53.

EARLY MOTHS.—On 10th January I noticed an *Erannis defoliaria* Cl. on a fence in this town and on 24th a *Theria rupicaprararia* Schf. *Nymphalis io* L. is passing the winter in my diningroom; it was flying round the electric light on 1st January.—CLIFFORD CRAUFURD, Denny, Gallopway Road, Bishop's Stortford, Herts. 12.ii.53.

MR. E. F. JOHNS OF WINCHESTER.—Referring to Mr. Symes' Note in the January issue of the *Record* (65: 17), when I was living at Crawley, from 1934 to 1936, I visited Mr. Johns several times at the large preparatory school which he ran and which was very well known. He also came occasionally to my house.

Quite a number of the boys in his school were interested in Entomology and, of course, they were encouraged by Mr. Johns and by a young master who, however, from what I remember, did not take an interest in collecting himself. I was asked to give the boys lessons in setting the insects, which they badly needed. I well remember one particular occasion when I went to give a lesson. One of the boys had just set a marvellous aberration of a ♀ *Anthocharis cardamines* and as a result of his efforts the forewings were full of pin-holes. I reset the insect, but, of course, the pin-holes had to remain. The undersides of

all four wings were very heavily streaked with wide stripes of orange; it was the most extreme form of this aberration that I have ever seen. I do not know what became of it but most probably it went into Mr. Johns' collection. This collection was a very small one in a small cabinet and I cannot remember anything very impressive in the way of aberrations except a specimen of *Lysandra bellargus* of which the undersides of the hindwings were heavily spotted.

When Mr. Johns retired, which he did a few years later, I think he removed to Devonshire, but I had no further contact with him. He most certainly never made any claim to catching *Carterocephalus palaemon* nor do I remember him telling me about the *Apatura iris* episode.—S. G. CASTLE RUSSELL, 5 Bridge Road, Cranleigh, Surrey. 25.i.53.

[Mrs. V. M. Johns has very kindly sent us a booklet by her late husband, Mr. E. F. Johns. It is called *Let the Twig Follow its Bent* and was printed at Winchester, but undated. Mr. Johns was a son of the Rev. C. A. Johns, author of *Flowers of the Field* and other botanical works, who founded Winton House School in 1863. This attractive little book, which gives an interesting account of the school and its activities, tells us that its founder "aroused keen interest in all sorts of subjects to which boys as a rule give slight attention. The chief of them was the collection of butterflies. Winton House boys were known all over the neighbourhood by the net which they always carried wherever they went."—ED.]

LABELLING SPECIMENS.—The Old Moth-Hunter's article "On Keeping a Diary" in the December issue prompts me to call attention to the labels on the specimens of some diarists, which bear nothing but a number, and although it is simple for the owner to find the necessary details by referring to the number in his diary, the specimen cannot be sent in exchange or as a gift until a data label is made out; and if the cabinets and contents eventually appear for sale, especially if by auction, the value of the collection is greatly diminished; for, of course, a rarity is almost valueless without a label with the usual data—locality, date, and name of captor. There was a case in point at a sale in London on 21.i.1953.

Then surely a label should be affixed with data side up, so that usually the details can be read without lifting the glass and the specimen; yet many collectors put the labels data side down, and upside down, so that even when the specimen is removed and inverted it has to be twisted round to allow deciphering. And surely the label should bear locality, date, and name of captor in that order.

The earliest collectors did not use data labels; but we hear of one collection sold in 1786 in which the specimens in one Lot are described as "all labelled"; so we can raise our hats to this pioneer—the Duchess of Portland.

As printed labels with name of captor and year are now so very cheap, neat, and legible they should be acquired each year; and with a map pen the locality, day and month can be added. Or if a big bag is made at one locality it is well worth while having labels printed complete, e.g., *Aviemore*, 6-17.vi.53. W. Smith. And this applies to breeding experiments or to m.v. lamp captures.

As to the paper on which labels are printed, why are some so thick? The British Museum uses paper of such thickness that I feel sure it must be difficult to penetrate it with a thin pin.

As to *identity* labels, one very successful collector who has used skill and perseverance for twenty-five years is so adverse to the recent changes in nomenclature that he has none at all in his cabinets. Perhaps this is a unique case; but some contemporaries may sympathise when they experience the strain of having to forget an old name which they have used for twenty years and learn a new one.

Years ago England had an unenviable notoriety in the world with regard to setting, preferring the 'English Method' with convex surface to the 'Continental' (which might have been extended to 'Rest of the World') with flat surface. Eventually we capitulated, and now there is uniformity.

So please let us have uniformity in labels, and the method of their application.—W. BOWATER, 41 Calthorpe Road, Edgbaston, Birmingham.

ERRATUM.—In the Explanation of Plate II (page 3), Fig. 5 should read "*ab. nubilata*", not *ab. quadricothurnata*.

Collecting Notes

NOTES FROM EAST HERTS. AND WEST ESSEX IN 1952.—So far as the macrolepidoptera are concerned the past year has been only slightly better than 1951. These notes are taken from my diary and concern a district included in a circle having a radius of six miles from the centre of Bishop's Stortford.

The spring began with a great scarcity of moths. In the May issue of the *Record* for 1951 (63: 82) figures were given for the insects observed on a certain fence within a short distance of my house. The numbers of *Erannis leucophaearia* Schf. were 15, 97, 117, 36, 21, 17 and 5 for the first three months of the years 1945 to 1951 (seven years): This year (1952) there were no *leucophaearia* at all. There were 3 *Erannis marginaria* Fab., 2 *Alsophila aescularia* Schf., 1 *Operophtera brumata* L., and 1 *Theria rupicaprararia* Schf., a total of 7 moths compared with the 178 of 1947. It was therefore anticipated that 1952 would be as poor a year as 1951 and I have not been far mistaken.

So far as butterflies were concerned, spring reports of the immigration of *Vanessa cardui* L. and other species promised well. My friend Mr. Allan saw a *cardui* in his garden on 12th March and I noticed one at candytuft in my garden on 10th April; but the numbers throughout the year were not much in advance of those usually seen. The blizzard we experienced in the last week-end of March must have been fatal to a large number of the immigrants. By careful searching, however, larvae of *V. cardui* could be found throughout the summer.

A fair number of hibernated butterflies was on the wing in April. The first *Pieris rapae* L. was seen on the 13th and *Anthocharis cardamines* L. on the 26th. *Pieris brassicae* L. was out on the 27th but was not in any great number during the year and was scarce in the autumn. *Pieris napi* L. and *Celastrina argiolus* L. were flying on 10th May; the first

Pararge megera L. was seen on 13th May and this insect was somewhat commoner than last year. *Argynnis euphrosyne*, of which we have a small colony within a mile of the town, was not seen until 17th May. *Erynnis tages* L. and *Pyrgus malvae* L. were flying on the same day. *Maniola jurtina* L. first appeared on 16th June. *Vanessa atalanta* L., *V. io* L. and *Aglais urticae* L. were less common in the autumn than usual. Between 21st August and 5th October *Colias croceus* Fourc. was flying in the local lucerne fields. These insects were nearly all males of which more than forty were seen, but there were only 3 type females and 2 f. *helice*.

Sugar was used on a good number of nights but nothing unusual appeared and the number of insects was no better than last year. *Amphipyra pyramidea* L. was very common (it usually is, here) but *Triphaena pronuba* L. and *Apamea monoglypha* Hufn. were in very small numbers. *Catocala nupta* L. was not seen until 10th August and it was commoner than last year. The latest one seen was on 1st October.

A m.v. lamp and trap was used in the garden for a few nights in June and again in August, September and October. The garden is rather enclosed by trees, so insects did not appear in any numbers. Among others *Amathes triangulum* Schf., *Apatele megacephala* Schf., *Caradrina clavipalpis* Scop. and *Apamea sordens* Hufn. appeared in June. In August *Atethmia xerampelina* Esp. was the only insect of note. In September *Agrochola lychnidis* Schf. and *Anchoscelis litura* L. were very common, together with a few *Conistra ligula* Esp., *Antitype flavicincta* Schf. and *Lampra fimbriata* Schreb. The other common species were *T. pronuba* L. and *Amathes c-nigrum* L. In October a few *Agrochola lota* Cl., *Allophytes oxyacanthae* L., *Brachionycha sphinx* Hufn. and a late *C. clavipalpis* were in the trap. A fine *Dytiscus marginalis* L. was also caught.

Throughout the year only four *Macroglossum stellatarum* L. visited the Valerian in my garden whereas in some past years as many as twenty could be seen flying at the same time. Upon the whole the year has been slightly better than 1951 but not much.—C. CRAUFURD, Denny, Galloway Road, Bishop's Stortford. xii.1952.

BUTTERFLIES IN HAUTE SAVOIE.—During the last two weeks of May 1952, my wife and I stayed at the village of Hermance on the southern shore of Lake Geneva. As we had our car we were able to explore the nearby country, making a number of day trips into the foothills of the Alps.

Our wants were peaceful and pleasant surroundings within easy reach and these were supplied by the group of hills in Haute Savoie known as Les Voirons. Accordingly it was there that we went on most days to eat our picnic luncheons. Views were good if not spectacular and the air was decidedly invigorating in comparison with that of the lakeside. We ascended to no great heights and hence failed to find *Parnassius apollo* L. and those true alpine flowers *Gentiana acaulis* and *Gentiana verna*. Butterflies were not present in great numbers but increased during our stay and reached their maximum on the last visit when, after passing through Bons and the Col de Saxel, we spent an hour or two above the village of St. Cerques. Here amongst marshy ground butterflies were in fair numbers.

Between the 21st and the 31st of May I caught the following butterflies amongst these hills:—*Aporia crataegi* L., *Pieris napi* L., *Euchloë cardamines* L., *Gonepteryx rhamni* L., *Leptidea sinapis* L., *Argynnis euphrosyne* L., *Melitaea athalia* Rott., *Euphydryas aurinia* Rott., *Aglais urticae* L., *Nymphalis io* L., *Vanessa cardui* L., *Pararge megera* L., *Erebia medusa* F., *Coenonympha pamphilus* L., *Hamearis lucina* L., *Heodes hippothoë* L., *H. dorilis* Hufn., *Callophrys rubi* L., *Polyommatus icarus* Rott., *Cyaniris semiargus* Rott., *Cupido minimus* Fuessl., *Glaucopsyche cyllarus* Rott., *Pyrgus malvae* L., *Erynnis tages* L., *Ochlodes venata* Br. & Grey., and *Carterocephalus palaemon* Pall.

Only two distant excursions were made. On the 26th of May we visited the Lake of Annecy and enjoyed an excellent meal at a hotel in Talloires. On the return journey we stopped on the Col de Bluffy which lies close to the east side of the lake. Here I took *Melitaea didyma* O. and *Plebejus argus* L.

On the 28th of May we travelled via Taninges and Samoëns to Sixt and the Cirque du Fer à Cheval. Butterfly species were similar to those taken in Les Voirons but in addition I saw but failed to net what appeared to be *Limenitis camilla* L.—F. M. G. STAMMERS, M.B., Fifield House, Manor Road, St. Albans. 30.xii.52.

COLEOPTERA

A Note on *Agapanthia villosoviridescens* Degeer

By R. S. FERRY.

Dr. Joy records the above species as very rare. For some time my wife and I had considered an expedition to Monk's Wood, Huntingdonshire, where this interesting Longicorn has apparently been taken on many occasions and in some numbers. Reference to its capture is made by Mr. Ray Palmer in *The Natural History of the Hitchin Region*. Mr. Palmer writes that he first took it on a thistle flower at Oughton Head Common in July 1924 and that since that date he has taken several other specimens in the same locality.

Oughton Head lies some two miles north of Hitchin and thus is only eight miles from our home at Welwyn. Our first visit there should have been too late in the season, but much to our delight my wife took a specimen of *villosoviridescens* on a thistle stem on the 5th September 1946.

At a subsequent visit to Oughton on 1st July 1950 we took fifteen specimens on thistle stalks and on *Heracleum sphondylium*. A further visit in that year, on the 29th July, produced one specimen after a long search. In the following year I visited the locality on the 15th July; the day was one of great heat and brilliant sunshine, and although I searched among the roots of the plants I was successful in obtaining only one.

Our visit to Oughton this year (1952) took place on 29th June and after an hour's intensive search in its old haunts we were faced with failure. However, my wife left me to my thistles and inspected a dense patch of *Heracleum sphondylium* near the bank of the River Hiz. Her action met with immediate success and in the next half-hour we could

have taken a further twenty specimens. The time was approximately 3.30 p.m., and I think that they were just beginning to come up to the daylight from the thick herbage below. A number were seen in flight.

There is little doubt that this beetle tends to disappear to shelter during hot sunshine and, therefore, if one feels one has found an appropriate station it is necessary to search deeply among the roots should the day be a hot one.

DIPTERA

ORNITHOMYIA FRINGILLINA CURT. ON A ROBIN IN KENT.—Although this species has been found on robins before in this country, the fly, according to Dr. J. Smart, 1939, in Edwards, Oldroyd and Smart, *British Blood-sucking Flies*, "appears to be rare in the British Isles." Mr J. F. Burton recently sent me two specimens caught by Mr. G. Manser on a robin at Beckenham, Kent, on 18th August, 1952.

Other References:—ASH, J., 1950. Records of *Ornithomyia* spp. (Dipt., Hippoboscidae) from Berkshire and Co. Durham in 1949. *Ent. mon. Mag.* **86**: 86-7. 1952, Records of Hippoboscidae (Dipt.) from Berkshire and Co. Durham in 1950, with notes on their bionomics. *Ent. mon. Mag.* **88**: 25-30. CRICHTON, M. I., and CAMPBELL, W. D., 1949, Some records of *Ornithomyia fringillina* Curtis (Dipt., Hippoboscidae), with notes on its reproduction. *Ent. mon. Mag.* **85**: 143-5. O'MAHONY, E., 1950, Ectoparasites from Fair Isle. 2. *Ent. mon. Mag.* **86**: 71. OWEN, D. F., 1953, *Ornithomyia fringilla* Curt. on Redwing. *Ent. Record*, **65**: 31.—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey. 17.1.53.

ERRATUM.—Page 31, line 22, for ORNITHOMYIA FRINGILLA CURT. read ORNITHOMYIA FRINGILLINA CURT.

ORTHOPTERA

The 'Drumming' of *Meconema thalassinum* Fabr.

By P. W. E. CURRIE.

According to Burr (*British Grasshoppers and their Allies*, 1936, p. 120) "Fabre has shown that during copulation, at night, the male drums the apex of the abdomen on the branch on which it is sitting, and so produces a faint drumming sound, which he compares to that of a woodpecker." Some observations which I made on a captive pair in 1951 satisfied me, however, that the sound is not produced by contact between the tip of the abdomen and the substrate. I quote from my notes:—

"30th Aug. Surprised the male in the act of drumming. The male was on a slender green willow twig, facing upwards, wings and elytra closely appressed and raised perpendicular to the long axis of the body. The abdomen appeared slightly elongated, turgid, transparent; it was held slightly S shaped . . . so as to bring the cerci below the level of the abdomen. The main axis was parallel to and well distant from the twig. On the drumming there was an extremely rapid vibration of the tip of the abdomen, so as to produce a hazy appearance. If anything

touched the twig it can only have been the cerci or, possibly, the last sternite—and at that very lightly.

"5th Sept. . . . the male was on the talc of the sides of the breeding cage. The abdomen was clearly raised at an angle of 10 degrees or more above the parallel with the talc, and the vibration was of very slight range. On two occasions I held the tip of my index finger lightly against the talc opposite the tip of the abdomen. Although I perceived a light vibration (very slight) there was definitely no impact—indeed the abdomen was barely, though very rapidly vibrated. It did not move more than a few degrees below its normal angle.

"7th Sept. The male was upside down on the roof of the cage, the abdomen hanging down well below the horizontal. Under a good light I could see clearly that the abdomen was only vibrated. There was definitely no contact with the surface. The whole body was held well clear of the surface on the long legs."

On each occasion when I have seen the drumming, the wings and elytra have been held well up, almost if not quite perpendicular to the surface, but I have been unable to detect any significant movement of these organs. The sound produced, though faint, is clearly audible to me at a distance of 12 feet. It is of short duration, not more than half a second, and is often repeated a number of times at intervals of 2-3 seconds. It does not appear to vary in pitch or character according to the material on which the insect is standing. My specimen, which I kept in my bedroom, drummed most frequently on warm still nights. Fortunately it would continue drumming after a strong light was turned on, and all my observations were made in this way. The female appeared to pay very little attention to the drumming, nor is her presence necessary as a stimulus, as I have had isolated males which drummed freely. The sound does bear a distinct resemblance in character to the drumming of a woodpecker.

This species can easily be kept in captivity, and will feed readily on the leaves of oak, rose and birch. I have once (27th Aug. 1950) found it in the field, at Bookham Common, Surrey, feeding on larvae of *Pristiphora testacea* (Jurine), a sawfly whose larvae feed in colonies on birch.

Fifty Years Ago

(From *The Entomologist's Record* of 1903).

CERURA BICUSPIS AT CROMER.—On September 10th, 1902, I took, in the neighbourhood of Cromer, a nearly full-fed larva of *C. bicuspis* on alder. I searched well for others but was not rewarded with a further find. For want of better accommodation the larva was kept in a tin box, and supplied with fresh alder leaves, upon which it fed well for nearly a week. On September 17th it ceased to feed, shrank a good deal in size, and spun up during the night on a piece of dried wood. Prior to pupation, it did not change to any extent in coloration, as would have been the case with a larva of *C. vinula*. I returned to London on September 20th, having, as luck would have it, to travel in a railway carriage which oscillated violently throughout the journey; I am, consequently, somewhat apprehensive as to the effect which this shaking up may have had upon the larva during its pupation.—A. RUSSELL.

A MIGRATION OF BEETLES.—Towards the end of July, 1897, this chafer (*Anomara frischii* F.) was fairly abundant locally for a week or ten days on the dunes above the submerged forest at Meols, and my wife and I visited the spot with the object of solving the mystery of their observed movements. The beetles commenced to appear from the sand and roots of starr-grass about ten a.m., reaching the culminating point of abundance each day between twelve and one o'clock. But the perplexing circumstance was that, within a short time from its appearance, each insect rose in the air and deliberately set off in a W.N.W. direction, over the dunes and out to sea. All the insects followed the same general direction, and chafers that were observed to fly towards an opposite quarter might have almost been counted on one's fingers. Whence (*sic*) went these would-be mariners, and for what purpose, since food was presumably abundant around them?—E. J. B. SOPP.

Current Literature

BEHAVIOUR, 4, has an interesting paper, at pp. 222-232, on "Some Experiments on the Camouflage of 'Stick' Caterpillars" by L. de Ruiter. In order to test the survival value of the resemblance of certain Geometrid larvae to sticks, experiments were carried out with *Ennomos alniaria*, *Biston strataria* and *B. hirtaria* and captive Jays and Chaffinches. Before being placed in the cage the larvae were killed, as movement in an unusual environment would mean instant detection. It was found that as the birds were used to the inedibility of sticks, which had been placed in the cage previously, they did not peck the larvae. Once a bird had found one stick caterpillar by accident they pecked at sticks until discouraged by not finding further caterpillars. The solitary habits of stick caterpillars thus have survival value should this situation arise in the wild, for if a caterpillar was discovered it would probably be the only victim. However, it was found that caterpillars were confused only with sticks of their own food-plant and some birds were able to distinguish them even from these. This suggests that natural selection has not yet produced the maximum possible protection for these larvae.

D. F. O.

Obituary

PHILIP P. MILMAN died at his home in Paignton, Devon, on 23rd September, 1952. His father and grandfather also were natives of that place, though his mother came from Maidstone in Kent. He was born at Paignton on 3rd November 1878, and was, therefore, approaching his 74th year. His father, Edwin John Milman (1853-1940), was interested in Lepidoptera, conchology and horticulture, and all three tastes were inherited by the son.

Although Milman had a sound knowledge of the British Lepidoptera, was an indefatigable field worker in his younger days, and discovered several species hitherto unsuspected to occur in Devon, he did not contribute a great deal to the magazines, his Notes in the *Entomologist* between 1907 and 1947—twenty-five in all—mostly recording immigrant species seen at Paignton. The only paper he wrote was in 1946: "*Hypena obesalis* Treits. in Britain" (*Entomologist*, 79: 212). But as

a correspondent on matters entomological he was at his happiest, and there can have been few writers whose letters gave their recipients more pleasure.

Our contributor, Mr. Frank H. Lees, who knew him well in his later years, writes: "I met him first in June 1939, and we became good friends at once. Some people, I know, found him (shall we say?) 'difficult'; I fear they did not realise that unhappy experiences, aggravated by his unpopular political views, were bound to hurt a deeply sensitive nature and induce not only independence of outlook but a tendency to dwell too much on the grievances of suffering humanity both in general and in particular. All that, however, did not affect his sincerity as a friend or integrity as a citizen, and he held everyone's respect as a scientific worker of clear understanding of the problems of horticulture, conchology and entomology. He was wonderfully informed on all matters pertaining to the Lepidoptera both local and general, and, ever kindly and generous at heart, was happy to impart his knowledge to others. His health and circumstances had restricted his activities for many years, but his interest never flagged. His enthusiasm over my own small successes with my moth-trap was as wholehearted as if they had been his own. I shall sadly miss his help and friendship."

Another friend, Mr. G. P. Sutton, pays the following tribute: "My memory of him goes back to Sugarloaf Hill. A cheery hail, "Any luck?" led to conversation and a real friendship. But for that chance meeting my scanty knowledge of the South Devon insects would have been much more limited. To those he loved, generosity was his middle name, and to me he gave full measure. That first season he handed over to me his favourite sugaring posts, and as the years went by these yielded *loreyi*, *unipuncta*, *vitellina*, *exigua*, etc. He was a simple soul, but not always easy to agree with. A deep-rooted sympathy for the under-dog led him to the support of extreme ideologies which made the avoidance of political discussion desirable. There was never a kindlier man. From time to time I learned a little of his personal history. He spent his early adult years schoolmastering, but that was abandoned for a personal reason. After a time he was with the Paignton Urban District Council and then, in the latter years, he grew flowers and fruit for the Paignton shops. He was very jealous of the Paignton amenities, and, regretting as he did the development of the town and the increasing hordes of visitors, it is somewhat surprising that he was ready to welcome visiting lepidopterists so warmly. But that was in keeping with his kindly nature."

Mr. Frank Lees adds the following personal touch: "In his prime his must have been a tall, strong, active figure; ageing, as I knew him, thin, a rather loose-cheeked face, clean shaven, with a clear complexion; rather challenging blue eyes; thinning white hair; with a gentle manner and voice. But I should imagine he could be very resentful towards the officious, the mean, and the arrogant."

Milman will not easily be forgotten by his many friends and pen-friends.
P.B.M.A.

We also regret to record the death of NORMAN HUMBERT JOY, M.R.C.S., L.R.C.P., who died at Chichester on 20th January at the age of 78. At one time he was Medical Officer at Bradfield College, Berks., and was well known as a coleopterist.

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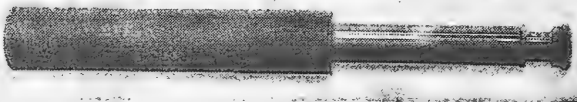
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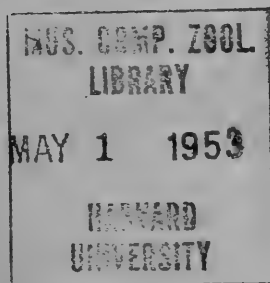
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By H. B. WILLIAMS, Q.C., LL.D., F.R.E.S.

Readers of *The Entomologist's Record* will be interested to learn that the very complete and celebrated collection of British Rhopalocera formed by Mr. S. G. Castle Russell has been acquired and presented to the Nation by our Editor, Dr. Cockayne, and is now housed at Tring as part of the Rothschild-Cockayne-Kettlewell collection.

It is possible that the full extent of Dr. Cockayne's gifts to the National collections is even yet not fully appreciated. His own collection, which is the foundation of the joint collection, contained the most complete series of British Heterocera ever accumulated and also some not inconsiderable series of Rhopalocera of substantial scientific importance. The addition of the Castle Russell collection will result in the joint collection containing a very representative series of most of the known forms of British Rhopalocera, so that the butterflies will approach the standard of the moths.

This is undoubtedly the finest addition to the joint collection yet made, and all British entomologists should be grateful to Dr. Cockayne for making such a collection available for study.

I had intended to refer to some of the more notable insects in the Castle Russell collection, but these are so numerous that they should form the subject of a later note. For the moment it is sufficient to say that very few of the major forms of our British butterflies are unrepresented and that there are many which few entomologists have ever seen. The collection is particularly strong in aberrations of Argynnis and Lycaenids and is further distinguished by the magnificent condition of the insects it contains.

All British entomologists are indebted to Dr. Cockayne for his very generous gift, and I am sure that he will be very happy if they show their appreciation by studying it in its new home.

The Rothschild-Cockayne-Kettlewell Collection

By E. A. COCKAYNE, D.M., F.R.C.P.

After many years' work the British Museum now possesses a collection of British Macrolepidoptera which, as a collection of the Lepidoptera of any single country, is unequalled. In no other collection can one see the names of subspecies and aberrations with their synonyms and references to the original descriptions on the labels. There is also a note on the genetics, when they are known, with references to the chief work or works in which they are described.

All the moths included in South's *Moths of the British Isles* have been arranged in Hill's ten-drawer units. The order and nomenclature of the Sphingidae, Bombyces (*sensu lato*) and Agrotidae (Noctuidae) adhere closely to those used by W. H. T. Tams and will be adopted in the new edition of South's work and have been published already in *Larval Foodplants* by P. B. M. Allan. The nomenclature and arrangement of the Geometridae, with a few exceptions approved of by L. B. Prout, is that used in Seitz *Macrolepidoptera of the World*, vol. 4.

The Rhopalocera are being arranged by A. L. Goodson. Gifts and purchases are continually being incorporated and names of newly de-

scribed subspecies and aberrations are being added from time to time, but the chief work has been accomplished and the collection is ready for inspection. Visitors are welcome and I shall be happy to arrange for anyone to see it during the hours when the Museum is open if I get an application by letter.

Since the list of donations was published in the *Entomologist*, 1950, 83, 19 a large number of additional gifts have been received, of which the following are some of the most important:—

Mr. A. L. Goodson has handed over his collection containing numerous aberrations of butterflies and moths.

Miss Monica Gibson, *Aphantopus hyperantus* Linn., the under side figured *Proc. South Lond. Ent. and N.H. Soc.* 1949-50, Pl. 2, fig. A; Mr. Michael Trapaud, 2 gynandromorph *Saturnia pavonia* Linn.; Mr. A. Valentine, *Melanargia galathea* Linn. ab. *valentini* Williams (paratype); Mr. E. W. Classey, *Xylocampa areola* Esp. ab. *wrighti* Tams (type and paratype); Mr. P. Siviter Smith, the types of *Eumichtis lichenea* Hbn. described in *Ent. Rec.* 1942.54.96; Major H. C. Gunton, *Meristis trigrammica* Hufn. ab. *eccentrica* Ckyne.; Mr. R. P. Demuth, 32 *Apamea exulis* Lefebvre ssp. *assimilis* Doubleday, melanic forms from Dalwhinnie; Mr. A. Smith, *Habrosyne pyritoides* Hufn. ab. *miranda* Ckyne.;

Mr. E. S. A. Baynes, *Selenia bilunaria* Esp. ab. *eblanaria* Baynes (type, allotype and 10 paratypes), *Cidaria fulvata* Forst. ab. with very narrow median band, gynandromorph *Bupalus piniaria* Linn., gynandromorph *Apamea secalis* Linn. figured *Ent. Rec.* 1940, 52, Pl. 5, somatic mosaic *Diarsia festiva* Hbn., *Cupido minimus* Fues. ab. *striata* Tutt, *Spilosoma lubricipeda* Linn. with dark margin and fringes; Mr. Austin Richardson, 5 *Cryphia muralis* Forst. ssp. *impar* Warren, Gloucester, 2 *Melanargia galathea* Linn. under side ab., 12 *Calamia virens* Linn.; Mr. A. V. Hedges, 2 *Thera firmata* Hbn. ab. *purpureo-brunnea* Ckyne. (type and paratype), 16 *Colobochyla salicalis* Schiff., 1 *Lampropteryx suffumata* Schiff. ab. *paradoxa* Ckyne., *Plemyria bicolorata* Hufn. ab. *semifumosa* Ckyne. (2 paratypes).

S. Gordon Smith, 33 *Selenia bilunaria* Esp., including 2 ab. *radiata* Boyes, ab. *superba*, *rubra*, and other forms named by him, 2 *Amathes depuncta* Linn., 2 grey forms, N. Wales; Messrs. H. S. and P. Robinson, *Tathorhynchus exsiccata* Led., *Amathes c-nigrum* Linn. albino, *Plusia gamma* Linn. ab. *bipartita* Orst., *Plusia ni* Hbn., *Lithosia quadra* Linn. ab. *luteomarginata* Lamb., *Apamea infesta* Ochs. ab. *lactea* Ckyne., *Scotogramma trifolii* Hufn. ab. *robinsoni* Ckyne., type, *Hadena lepida* Esp. ab. *aurantia* Ckyne., type; Mr. T. G. Howarth, *Agrotis cinerea* Schiff., figured Barrett, *Omphaloscelis lunosa* Haw. ab. *intensa* Turner, *Rhizedra lutosa* Hbn. ab. *crassicornis* Haw.; Mr. S. Galpin, *Callimorpha dominula* Linn. 2 ab. Rippon B.

Mr. J. P. Robson, 12 *Oporinia dilutata* Schiff. ab. *latifasciata* Prout; Mr. C. H. Hards, *Charadra deridens* Guen. in light trap at Plumstead, an American species; Mr. R. M. Craske, *Pseudopanthera macularia* Linn. ab. *fuscaria* Stdgr., *Chiasmia clathrata* Linn. ab. *alboguttata* Fettig, and a light ab.; Mr. Nigel Easton, *Pieris napi* Linn. ab. *rotunda* Easton, 2 paratypes; Mr. Frank Lees, larvae from which a series of 13 *Plusia ni* Hbn. was bred; Mr. G. Haggett, *Agrotis cinerea* Schiff. figured Barrett.

Dr. H. B. Williams, *Aglais urticae* Linn. ab. *pallida* Mosley, figured Mosley's *Illustrations*, Pl. 5, fig. 1, *Leptidea sinapis* Linn. ssp. *juvernica* Williams, type, allotype, 2 paratypes, *Eumenis semele* Linn. ssp. *thyone* Thompson, type, *Cleora rhomboidaria* Schiff. ab. *haggarti* Williams, type, allotype, *Arctia caja* Linn. ab. *mediodeleta* Ckyne., type, 4 *Abraxas grossulariata* Linn. ab. *aureomarginata* Ckyne., 15 hybrid *Lycia hirtaria* Clerck ♂ × *Pöecilopsis lapponaria* ♀, 347 *Angerona prunaria* Linn. including 12 types and many paratypes, aberrations of *Bupalus piniaria* Linn. and 2 gynandromorphs, aberrations of *Cryphia muralis* Forst. including ab. *albida* Colthrup, type and allotype, *Cryphia perla* Schiff. ab. *alba* Colthrup, type and allotype, 4 gynandromorph *Gonepteryx rhamni* Linn.

Mr. Cyril Mackworth-Praed, 3 *Tethea ocularis* Linn., melanic; Mr. John Lobb, *Argynnis euphrosyne* Linn. ab. *edna* Lobb, type; Messrs. L. H. S. Chevallier and L. Christie, *Lampides boeticus* Linn. ♂ and ♀; Baron de Worms, *Drymonia dodonaea* Schiff. ab. nov.; Mr. Sydney Turner, *Cirrhia icteritia* Hufn. ab. *peraurantia* Turner, type, *Xanthorrhoe fluctuata* Linn. ab. *immaculata* Tutt, *Horisme aquata* Hbn., *Selidosema brunnearia* Vill. ab. *intermedia-fumosa* Turner, type, *Lycaena phlaeas* Linn. ab. *schmidtii* Gerh., *Catocala promissa* Schiff. red replaced by white on hind wings, *Apamea infesta* Ochs., albino; Mrs. Graves, *Arctia caja* Linn. with no dark markings on fore or hind wings.

Other gifts have been received from Messrs. C. Q. Parsons, H. C. Huggins, A. J. Wightman, J. T. May, G. Youden, C. Down, S. B. Hodgson, Oliver Howard, P. Freeman, C. M. R. Pitman, A. M. Morley, and W. Bowater.

I have bought at sales or by private treaty a large number of aberrations including a beautiful albino *Catocala nupta* Linn. and several types, the B. W. Adkin collection of Lasiocampidae, and some of the late F. W. Sharman's aberrations of *Arctia caja* Linn.

Recently I have acquired the famous Castle Russell collection of aberrations of British butterflies, which will raise the level of the butterflies in the Museum to that reached already by the moths. As a special favour Mr. S. G. Castle Russell has generously allowed me to take over the collection in his lifetime and it is now available for examination at Tring.

Lampides boeticus Linn. in South West France

By VERA MOLESWORTH MUSPRATT, F.R.E.S.

I was very interested in Mr. L. H. S. Chevallier's article on *Lampides boeticus* L. in *Ent. Rec.*, 64, 274, as in 1950 I bred some myself here at St. Jean-de-Luz though entirely on garden peas. I was so certain they were going to be difficult to rear and that I should fail in the attempt that I took no regular notes. Though they all I think resulted in butterflies it was more good luck than good management and I missed an opportunity which has not yet occurred again to find out lots of things!

In 1950 the first *boeticus* I saw, a male, was on the 29th of May, flying round some full grown peas which were just showing long flat pods in my garden. I did not see numbers on my usual rounds (of about

1½ miles) in June, but either there were more in the region than my records show or else all the eggs laid flourished better than usual, as in July there were hundreds of the butterflies in extremely fresh condition all over the place.

On the 17th of June my cook told me there were numbers of "worms" in the peas she had just shelled. The "worms" proved to be caterpillars, and I saw that they were probably those of *boeticus*.

I collected some pods in the garden on which were minute holes (more like round stains) where the caterpillars had entered them, which I proved by opening some of the pods; so, taking five or six of the unopened pods I put them in a cage. I realised that in most of the pods growing on the plant there would probably be sufficient peas to last until the caterpillar was fully fed, but that the pods in the cage would soon dry up. So after three days I opened the pods, to find the caterpillar or caterpillars (I found two in one pod and three in another) looking very healthy but the peas a bit dry. I cut off one end of the old pods in which were the caterpillars and cut one end of a fresh pod, inserting the old one in the new, hoping the larvae would leave the drier peas and find the fresh ones. It worked beautifully, as when I began the same operation three days later I found that all the larvae had removed themselves to the new pods and were eating the fresh peas. This went on till the end of June, though the last time I changed the pods it seemed to me that two or three caterpillars were missing, but as I had not counted them I could not be certain. On the last day of June I found all the pods empty, with one sad looking caterpillar outside one of them, and no trace anywhere of the others: they had all escaped! Needless to say the cage did not shut properly. I told no one, as between the bottom of the door of the room and the floor there were possibilities! Like Mr. Chevallier I hunted, but I found nothing; so I just hoped.

On the 9th of July three *boeticus* were out, fluttering up and down the mosquito netting at the windows. The imagines kept appearing until the 16th. Eight emerged in all, which was about the right number, according to what I could remember. The caterpillars had been all sizes though none very small and I do not think there was any cannibalism.

The unhappy caterpillar left by its companions sitting outside a pea-pod was in the evening surrounded by little silken cocoons, like *Apanteles glomeratus* but I think smaller, and pure white instead of yellow. I sent the whole lot to Mr. C. B. Williams of Rothamstead, who passed them on to the British Museum where they are believed to be a new species of *Apanteles*.

In my garden I have some Everlasting Pea and in 1950 it never produced one pod, but all the flowers were eaten by wild *boeticus* larvae. I tried to rear three of them, but the flowers gave out, so I put my captives back on the plant to fare as best they could, as the green peas were then dried up and no use. The caterpillars attacked the buds before these opened and my Everlasting Pea was a sorry sight as the petals were mostly totally eaten or in rags hanging here and there.

The caterpillars played some havoc with my green peas in 1950; in every 4 lbs. of peas there was a big handful of "wormy" pods, and asking a couple of gardeners about a mile from my house if they too

had "worms" in their peas they both answered "far too many!" I have never heard that *boeticus* has been a real plague on garden peas, but I remember one incident in 1917 when I was nursing at Nevers (Nièvre) where it is possible that *boeticus* might have been the culprit. At lunch one day we were offered green peas that were so full of caterpillars that there seemed to be as many larvae as peas. We all looked at them and refused, till the dish got to the last nurse who, after gazing at it for a minute, said "Well, they are all pea" and took a good helping! I heard afterwards that the doctors had been given a similar dish, so there was a row! The cook as an excuse said that all the peas at that time were "wormy".

My caterpillars never seemed to stir from their pods till they were going to pupate. I presume that once in a pod they remain there, if there are sufficient peas, till they are fully fed, if not they come out and find another pod in which to continue feeding, or else they may eat the green pea flowers, as I once found two large ones eating these. From what I saw of the pods left in the garden after they had quitted them I think they eat out a hole, as they do to get in, but the hole was naturally bigger. In the case of the captive larvae they probably found space to slip between the old pods and the new, as there was no exit hole on these pods.

I have caught and set some numbers of *boeticus* to try and find out if the size differs according to the brood. It is well known how unusually variable they are in size, both male and female, but I think (this is very tentative) that the first lot of females to arrive here in May-June are on the whole on the large size. I have not yet found a small female at this season. The October lot are on the small size, males and females more uniform in size, the July brood showing much bigger differences, so that Mr. Chevallier's female who was so small is in accordance with the extremely variable size of the summer brood, though she seemed unusually small.

Monsieur l'Abbé Vigneau who lives not far from Bordeaux noticed the general smaller size of the autumn brood in 1951, which was a big one there that year, and kindly sent me this observation which conforms to mine. However, I feel that I must get more specimens spread over more years before I am able to put forward these differences in size as a usual occurrence.

I was able to study *boeticus* in 1950 better than I had ever done before as there were, first, hundreds in this region, and secondly it was the first time I had stayed here in July since 1925, as in other years I had always been climbing in that month in the Pyrenees. My knowledge of *boeticus* behaviour in this region before 1950 was only this: that this species turned up at the end of May-June; that in August I found odd specimens here and there; and I knew that in October they were here again; but I had never caught any really fresh specimens at any time. I doubt if I should have been certain enough to write about *boeticus* behaviour here in July if the multitude in 1950 had not existed.

When the *boeticus* arrive here in May-June they lay; the butterflies of this brood come out in July, and about the same time a second wave of immigrants turns up. This was particularly marked in 1950: the local brood had emerged and were flying in numbers, then a few days later there seemed to be double the number, so many in fact that I could

stand at the edge of a lucerne field in flower and catch as many as I liked with ease. I boxed them to see their condition, which proved important as 50% were very fresh and 50% worn. This occurred again in 1951 and 1952 but in such few numbers that I doubt whether I should have realised that there was a second wave of immigrants: I should have put down the old specimens to the remains of the first immigration.

Monsieur de Lesse of the Paris Museum kindly let me know that in July 1950 he had seen hundreds all going north on the high passes of the central Pyrenees east of Luchon, Hte. Garonne. I have noticed for many years that in July in the central Pyrenees *boeticus* is very often at high altitudes, 1,600 m. to 2,000 m. and sometimes over. Once at 2,600 m., in a very arid part of the Pyrenees above Luchon near a half frozen lake surrounded by snow with only a few patches on which were flowers just out, I came across about 50 *boeticus* busy at the flowers. I had rather wondered at the time why they had come so high to find so little food. Until 1950 I had always thought that these butterflies had come up from the valleys after the flowers and had not then any idea that there might be a July migration over the mountains. Now I think this second wave occurs every year.

Neither the brood born here nor the July immigrants seem to lay here. I think the local brood goes north and lays when it arrives at its destination, though I have seen the fresh females mate indifferently with fresh or ragged males. In my opinion the female Mr. Chevallier caught on the 6th of July at Ranmore Common was probably a descendant of a first brood born somewhere in France. The second immigrant wave seems to remain here, anyhow partly, as until the middle of August one sees *boeticus* getting fewer and fewer and more and more worn, then there are no more or a very occasional one till October. If either the first brood or the second immigrant wave laid here, about the 15th of July, one should see their descendants at latest at the end of August, but this is not the case: they are conspicuous by their absence.

After puzzling for some time I began to wonder if a migration from the north did not reach us in October! I got two observations which I thought after the second one were fairly conclusive in this direction. Twice a kind friend took me to the Landes, about 45 km. north of St. Jean-de-Luz, on the 8th of October in 1950 and 1951, and there I saw the insect in some numbers. A few days later *boeticus* was in our region; none were very fresh but none that I caught was in a bad condition. Before these numbers were seen in the Landes I had seen none for some weeks round St. Jean-de-Luz.

My supposition of this annual southern migration seems now, to me, confirmed. I was camping in the Pouey Aspé valley above Gavarnie, Htes. Pyrenees, at about 1,900 m., at the end of September and beginning of October and I saw them migrating: in the Pouey Aspé valley and over the Port, 2,252 m. at the head of this valley; on top of the Pic entre les Ports, 2,480 m., north of the Port; and I found one on a glacier at about 2,700 m. below the Brèche de Roland on the French side. This solitary specimen, a male, was too cold to fly properly, but I boxed it and took it down with me; it flew off in my garden two days later, apparently quite recovered.

In the Pouey Aspé valley on the 26th and 29th of September I had seen *boeticus* going south, or rather W.S.W. as that was the trend of

the valley. To go due south they would have come up against the north-western buttresses of the Cirque where there are mountains of over 3,000 m.; the north-western slopes of these were already covered with snow that had fallen before I arrived and where it would probably remain till June. This cold region must have repelled them, so they remained in the sunny part of the valley taking the nearest direction south they could go with security.

The 30th was grey and cold with an icy wind, raining in the evening and turning to snow that night. Next morning there was about four inches of snow on the ground; a bottle of water *inside* a tent was half frozen, and ice had formed on each side of the torrent in spite of the fast moving water. The snow remained on the ground all that day and night, melting on the 2nd (October), so that on the 3rd no snow was left in the bottom of the valley. It was a beautiful warm sunny day on the 3rd but in spite of this cold spell *boeticus* was on the wing again in the valley, not many but they were there, and I saw one at 1.30 p.m. crossing the Port, 2,252 m., which was still covered in snow.

I think the little fellow I picked up on the Brèche glacier could not have got up there before the 3rd as it was not fine enough on the 2nd for butterflies to appear even in the valley and he would have been buried in snow if he had got up there before the 30th September. Even a sunny day in October is a short one, so that it is more likely that he was caught on the glacier as the sun went down on the 3rd. On the 4th when I rescued him at about 2.30 p.m. the brilliant sun had in spite of the snow revived him sufficiently so as to be able to flutter weakly. I do not know how many nights it would take to kill a butterfly lying in snow at 2,700 m., perhaps only one! So perhaps on the 4th he had almost got to his goal, the Brèche de Roland, when his strength gave out and he landed on the glacier, to get slowly colder and colder till I picked him up. However, after our snowy spell with icy wind it does show how resistant these frail-looking butterflies are and I think that in May-June when the days are longer and hotter *boeticus* is capable of flying over the whole Pyrenean range and probably does this regularly every year to populate the French valleys and plains on the northern side. To be certain of this many observations and observers would be necessary as the range is long and *boeticus* is not usually common in the spring.

I wondered about one question when I was camping, and that was the total lack of food for the butterflies at that time of the year and at that height. For as well as cold spells that must at times prevent them from continuing their journey for a few days they have to climb at least 2,000 m. in the central Pyrenees and down again on the southern side without being able to feed. Cow pats had no attraction whatsoever for them in the valley. I should think the last place where they would find sufficient food in the Gavarnie valley would be on the enclosed plain round Argeles, roughly about 35 km. from Gavarnie; after that a little clover would be still in flower with some dandelions, these getting scarcer as they climbed, till only a few dandelions would be found round Gavarnie and hardly any in the valley, with a few (I saw three or four) thistle flowers. It seems a long way to go with no food, cold not to say very cold nights, and few enough sunny hours in the day for them to be able to continue their journey. Round the tents I never saw a butterfly be-

fore 9.30 a.m. The sun reached the tents at 8.20, and it was only at 10 o'clock on a sunny morning that they really began to appear. At three in the afternoon they nearly all seemed to have found their night quarters.

In the real south of France, *i.e.* the Mediterranean region, *boeticus* is able to maintain itself all the year round, though they must certainly be reinforced by immigrants in the spring. In the Oriental Pyrenees, the valleys of which are very sheltered, it is possible that when they migrate north in the spring (which should be earlier than those to arrive here) they may fan out, not all going north, which would bring some westwards; but I wonder if they really do so, if they come sufficiently westwards to get to the plains north of the central Pyrenees, and when once on those plains would they go *south* to populate the northern valleys? It would be against their northern urge! That is why I think *boeticus* in the northern Pyrenean valleys from the Ariège to the ocean come over the Pyrenees and not round them.

Is *boeticus* capable of maintaining itself all the year round in the northern plains or valleys of the Pyrenees? Some of the lower valleys are very protected and sunny; but I wonder if it is consecutively warm enough for them in any stage of their existence to get through the winter there; in some warm winters maybe! That they are unable to do so here at St. Jean-de-Luz seems to me certain, but there is something about this climate that prevents some species of Lepidoptera which are indigenous a good bit further north in France from being so here. So far I have been unable to find any reason for this fact other than the excessive rainfall and extreme dampness of the climate.

The Successful Winter Breeding of *Lampides boeticus* Linn. in Captivity in England

By C. A. CLARKE, M.A., M.D., F.R.C.P., F.R.E.S.

On October 29th 1952, Mr. Valletta of Malta kindly sent me by air mail two living females of *L. boeticus* which he had caught in his garden a few days earlier. One of the butterflies was dead on arrival in this country on November 1st, but the other had survived and was placed in a glass-fronted muslin-covered wooden cage, 16" x 16" x 16". With her were put, in water, branches of flowering gorse, some autumn lupins and some fresh lupin pods. The cage was kept in a greenhouse heated so that the temperature did not fall below 55° F. and in the cold periods of November and December it was approximately at this level for most of the time. The butterfly started to lay on November 5th and on this and the succeeding few days she deposited about thirty eggs either on the gorse buds or on the lupin pods.

The young larvae began to hatch out on November 11th and several of them were seen to burrow at once into the food-plant, both gorse buds and lupin pods being equally acceptable. The lupins withered after about ten days and thereafter gorse was the sole food-plant; this was readily available on a nearby common and some of it is always in flower throughout the year. Nothing more was seen of the caterpillars for a month and I am, therefore, unable to give any information about cannibalism in the early stages. On December 12th, 1952, to my great pleasure, I suddenly saw four larvae three-quarters grown feeding on

the gorse buds. I had been careful not to throw away any dead food-plant and had introduced fresh gorse buds periodically.

During the next few days I found eight larvae, some being of the green and some of the brown variety. These were segregated in glass-topped tins (two to a tin) so that I could observe them more closely and the first of them pupated on December 27th. I surmised that other caterpillars had been left behind in the cage and I was not surprised to find that on the mild morning of 11th January, 1953, two fine males had emerged and were resting on the outside of the cage. Butterflies from the segregated pupae followed within the next few days, and I had in all ten imagines from the original eggs.

The life cycle described is longer than that given by Frohawk for the summer broods, but whether under natural conditions the winter broods take longer to develop is not known to the writer.

The success of breeding the butterfly in the winter in this country would seem to depend entirely on two points:—

- (1) the fact that gorse flowers are obtainable throughout the winter, and
- (2) the availability of a moderate degree of artificial heat. It seems likely that enough warmth could be obtained by simply keeping the larvae indoors in a warm room.

A Holiday in Western Ireland

By J. N. MARCON.

I had long wanted to go to Ireland to hunt for the beautiful form of *Polyommatus icarus* Rott. to be found there. Having obtained much information as to the localities of this insect from as many kind friends as I could, my wife and I duly arrived at Belmullet, Co. Mayo, towards the end of June, after a calm night's crossing to Dun Laoghaire (Kings-town) in a comfortable ship and motoring 180 miles over fairly tolerable roads. The scenery for the last thirty miles or so is very fine, but the town itself, within a mile or so of a 3,000 miles expanse of water stretching to America, did not belie its description as 'the windiest corner in Ireland'.

I was told to make for the sandhills about two and a half miles away, so next morning we motored within easy walking distance, and going down somebody's private drive to their house (trespassing seems of little or no account in Ireland), the spot I was making for was easily accessible over one or two fields.

It was plain that the description of the locality and its approach were accurate. On reaching the sandhills it was not long before a few 'blues' were to be seen, but they were not so easy to capture in the wind. Seeing and capturing are two different things, especially when the wind drives any insect that rises more than a few feet far out of reach of net and even out of sight. In the circumstances I was quite pleased to net a couple of males in a reasonably short time; but the females, less distinctive, were harder to locate. After an hour and a half I returned to the car quite satisfied with ten insects. Back to the hotel for lunch and then another hunt, this time exploring other sandhills not far from the original spot. Here there were fewer butterflies. A lot of ground was covered before I got back to the old place, by which time the afternoon

was wearing on. Then came a joyful surprise. On the leeward side of the larger sand dunes were to be seen several *P. icarus* together at rest on the more favoured dunes. In a short time I had filled all my boxes, and with two *rufa-puncta* males and 1 *transformis* female the first day's experience with Irish *icarus* was a satisfying one.

Next day we made off to Achill Island. There are only three kinds of roads in Ireland; moderate, bad, and excruciating. Main roads are, by English standards, passable, secondary roads are bad, 20 m.p.h. being the maximum advisable speed, and everything else is excruciating; on one occasion we were shot up to the roof over a bad patch when we were doing only 8 m.p.h.

The scenery was mostly flat ground with hills in the distance, sometimes far away, sometimes quite close. Not many likely places for butterflies were seen on the whole trip of about 175 miles; and those we did stop at produced nothing. Achill itself is a glorious island of mountain and lake, divided from the mainland by a bridge, and ideal picnic spots were quite frequent.

It was a lovely excursion; but no butterflies were seen.

Returned for high tea—and what meals they give you in Ireland! You have to be careful not to contract what they call the 'English disease' which is a disease someway below your neck, which comes from eating larger amounts than we are accustomed to over here. After tea the old spot was visited once again for two and a half hours until 9.45 p.m. Again on favoured dunes there were many at rest, 135 males and 37 females being counted.

Next day, the only wet day of the trip, we made off to the Sligo area. We were fortunate in having quite tolerable weather—for Ireland; not much sunshine, but only one day's rain in three weeks; though nearly always there was a wind blowing as only the westerly wind coming across the Atlantic ocean can blow!

We were fortunate in finding a boarding house at the edge of the Golf Course at Rosses' Point which could put us up. The scenery here is very fine, water on three sides with impressive mountains in the distance, some of which have an unusual rock formation in which 200 feet or so of their sides are precipitous. We made various trips to the beautiful lochs around. I was always hoping that I might see *C. tullia* or a worn *M. aurinia*, but no sign of either was anywhere to be found. In the evenings I concentrated on the Golf Course and the slopes around; here there were always a moderate number of *P. icarus* to be found and examined.

One evening I walked down the road opposite the boarding house; there were some grasses on both sides; a few yards down was one lone *icarus* perched; should I go across and look at it or not? Oh well, I suppose so. Immediately I picked up its antennae and its wings flashed open I knew it was a gynandromorph; it was the only one I saw.

A week later we had to move on and went to a 'resort' about 10 miles away, which on a previous visit had looked promising. A 'resort' in Eire is one street leading to the sea, with a row of houses at intervals on either side. This was one of the best places we struck for *icarus*. At the far end one late afternoon I saw masses of them with their wings open, as it was unusually calm and sunny. I thought I saw a gynandromorph but it flipped up and though I tried to follow it I was un-

successful; perhaps it was an illusion. Contrary to my usual practice I did not count the number, but there appeared to be hundreds. Returning two evenings later, I was surprised to see only a few insects, why I do not know.

We then motored down to the coast of Co. Galway, through magnificent scenery of mountain and water, to spend our last eight days at Clifden. We made various trips and prospected the country round Galway itself, but *icarus* was almost non-existent and butterflies were few, with the exception of a lovely wood at Lock Ballynahinch, where there were some *A. paphia*, a few *A. aglaia* and a lot of *A. hyperantus* and *M. jurtina*. *A. aglaia*, by the way, was very common on the sand-hills by the sea; I counted four sleeping on the grass stems one evening.

My impressions of the country are of a delightfully friendly people, a rather dull interior, a most glorious coastline, masses of lochs, beautiful hills near or far of a lovely pastel shade, endless stacks of peat, and the ubiquitous donkey as the main means of transport.

Macrolepidoptera in North East Derbyshire : A Record for 1952

By J. H. JOHNSON.

(Continued from page 72.)

Cerura vinula L. (1). June 25. This specimen was found on a willow bush at Heath. It laid 100 infertile eggs. Only one larva was found in spite of careful searching throughout the summer. It is usually plentiful even on the moors.

Pheosia tremula Cl. (1). July 20. The only imago taken in this district for many years; larvae are occasionally taken on black poplar.

Notodonta dromedarius L. 6 larvae beaten from birch in Hardwick Wood in one hour on August 28.

Lophopteryx capucina L. (5). June 19. July 18. Larvae were found on birch bushes on Beeley Moor, Tupton Wood, and at Heath.

Phalera bucephala L. (4). June 10. None was attracted to light, but 4 bred females placed in the garden were found *in cop* with 4 feral males the following morning. Larvae were far less numerous than usual, only one small colony was found.

Achlya flavicornis L. (10). March 9. April 6.

Orgyia antiqua L. (1). August 21. This solitary ♂ was found at rest on a birch bush on Darley Moors. In February a cocoon was found in Brittan Wood and in September a batch of eggs was found attached to heather on Beeley Moors.

Euproctis similis Fues. (12). July 31. August 5. The distribution of this species is interesting. At Heath an occasional larva was found on hawthorn hedges, at Palterton and Langwith every yard of hawthorn hedge contained at least one larva, and in some places there were so many larvae that they were defoliating their foodplants. At Hepthorne Lane, despite abundance of hawthorn, not one larva could be found, nor did Tupton Wood reveal one either. There was none on Beeley Moors, probably because of lack of hawthorn.

Poecilocampa populi L. (1). November 13. Taken at street lamp.

Lasiocampa quercus L. No imagines were seen, even the 3 pupae which I obtained from caterpillars found on Beeley Moors in 1951 were

"stung" and produced fine large *Ophion ichneumon* flies. This year 56 larvae were found without difficulty feeding on bilberry and *Calluna vulgaris*. On May 24 14 larvae 2" long were found resting on stone walls above the food plant. The first cocoons were made on July 8.

Macrothylacia rubi L. On May 25 a bred virgin female was taken on to Beeley Moors, but failed to attract a single male between 1.0 p.m. and 8.0 p.m. I tried with another female on June 1, but without success. This was a surprise when the extreme abundance of the larvae in 1951 was recollected (*Ent. Rec.*, 64: 22). I searched in the same place on the same date this season and found only 6 larvae in an hour. On October 18 I searched the moors from 10.0 a.m. to 5.0 p.m. and found only 14 larvae; it was a sunny warm day, exactly the type on which *rubi* likes to bask in the open on the grass. Even at this late date, these larvae were by no means fully fed, and I noticed that 6 of them were still feeding on cranberry leaves in their hibernaculum in the garden at mid-day on December 20.

Saturnia pavonia L. (65). May 4. May 20. Imagines were abundant on Darley Moors. 52 males were assembled to a bred female in 1½ hours on May 17 (*Ent. Rec.*, 64: 351). Larvae were not so common this year. I searched the heather on Darley Moor for 1½ hours on July 26 and found only 3, and one of these was "stung". Of 33 pupae bred from collected larvae last year, 8 have not yet produced moths or parasites, although they are still obviously alive.

Drepana falcataria L. 6 larvae beaten from birch bushes in Hardwick Wood on August 26.

Cilix glaucata Scop. (9). May 17. August 9. All taken in garden light trap.

Nudaria mundana L. (1). July 29. This was found at sugar at Stubbin Court.

Spilosoma lubricipeda L. (8). May 17. June 28. All taken in garden light trap. One larva feeding on rhubarb August 23. 2 found feeding on knotgrass September 6.

Spilosoma lutea Hufn. (11). June 2. June 30. All taken in garden light trap. 12 larvae found on coltsfoot leaves in August.

Cynia mendica Cl. (1). July 3.

Phragmatobia fuliginosa L. (1). May 17. 6 nearly black larvae found on *Calluna vulgaris* on Darley Moors in September, 2 on willow-herb at Hepthorne Lane.

Parasemia plantaginis L. 2 larvae found on grass on Darley Moor on May 4. This species is uncommon here.

Arctia caia L. (3). July 7. July 22. By carefully searching roadside herbage in the Spring I found 48 larvae feeding usually on dock or nettle. The undersides of the wings of one bred imago were almost completely white. I obtained eggs from it and subsequently in October a few imagines. I was surprised to find that the undersides of their wings were nearly completely dark brown. Larvae from one of these moths are still feeding on dock on December 31.

Callimorpha jacobaeae L. (6). April 18. June 28. The first specimen was unusually early. It was taken at a street lamp close to Tupton Woods about 11.0 p.m., April 18. A few larvae were found feeding on most pieces of waste land from Darley to Langwith.

- Agrotis exclamationis* L. (4). June 19. August 1.
Agrotis ipsilon Hufn. (4). October 24. All at ivy bloom near Stubbin Court, Ashover.
- Diarsia brunnea* Schf. (2). July 18.
Ochropleura plecta L. (1). June 29.
Amathes castanea Esp. (2). August 21. Found at rest on pine trunks in Beeley Plantation.
Amathes baia Schf. (5). August 5. August 12.
Amathes xanthographa Schf. (365). June 2. August 30. Whenever and wherever sugaring was tried, this species was sure to appear sooner or later, exhibiting great variation in coloration. In Spring the larvae could be found on most mild evenings feeding on grass everywhere.
- Triphaena pronuba* L. (170). June 11. August 29. Usually at sugar, 3 in light trap. Extremely variable, many reddish forms, a few shiny "mousey" forms.
- Phalaena typica* L. A score of larvae were taken feeding on dock leaves in the Spring, but no imagines were seen at light or sugar.
- Anarta myrtilli* L. (Myriads). May 17. July 5. Everywhere on the moors this species was abundant among the heather.
- Mamestra brassicae* L. (8). June 11. August 7.
Melanchra persicariae L. (3). July 1. July 16. The larvae seem to be fond of elder, 6 were found on this plant in September.
- Diataraxia oleracea* L. (9). June 4. July 20. Larvae abundant on weeds in cornfields.
- Ceramica pisi* L. (4). June 6. July 20. Taken at sugar, light and resting on trees. The larvae were abundant on weeds in cornfields, a few were found on heather on Beeley Moors and a dozen were found feeding on wormwood.
- Hadena bombycina* Hufn. (5). May 24. At rest on walls, Beeley Moors, usually near to bilberry bushes.
- Hadena serena* Schf. (8). May 24. June 9. Taken at flowers, light, resting on walls. No larvae found.
- Hadena bicruris* Hufn. Larvae in white campion seed pods.
- Orthosia gothica* L. (7). April 15. May 4. Taken at street lamps. A fine red var. was found on heather, Beeley Moors.
- Orthosia stabilis* Schf. (4). April 15. April 25.
Orthosia incerta Hufn. (7). April 13. April 25.
Orthosia munda Schf. (1). April 25.
Orthosia gracilis Schf. (2). April 11.
- Tholera popularis* Fab. (5). August 30. All in garden light trap on one night.
- Tholera cespitis* Schf. (11). August 30. September 1.
- Cerapteryx graminis* L. (13). July 21. August 11. Usually more abundant than this, at light and flowers.
- Leucania pallens* L. (Myriads). July 6. July 28. A few appeared at sugar and a few at light, but a few minutes' examination of willow-herb flowers with a lamp after dark revealed hundreds of this and the next species.
- Leucania impura* Hb. (Myriads). July 6. July 28.
Leucania lithargyria Esp. (1). July 24.
Leucania conigera Schf. (1). July 25.

Cucullia absinthii L. (1). July 10. This imago was taken at flowers. The larvae were extremely abundant, 75 were found in an hour's search on September 20 on wasteland near Hepthorne Lane.

Cucullia umbratica L. (1). July 9. At rest on tree.

Lithomoia solidaginis Hb. (6). August 21. Found at rest on birch trunks and walls on Beeley Moors in 2 hours' searching.

Allophyes oxyacanthae L. (2). September 24. October 15.

Parastichtis suspecta Hb. (1). September 3.

Antitype chi L. (68). August 7. August 29. This appeared earlier than usual. Of this 68, 2 were var. *suffusa*, and 30 were var. *olivacea*. Two were found at sugar at Hepthorne Lane, the rest were found at rest on walls.

Eupsilia transversa Hufn. (5). October 24. All at ivy blossom near Stubbin Court, Ashover.

Agrochola macilenta Hb. (3). October 26.

Agrochola circellaris Hufn. (35). October 23. All at ivy blossom.

Agrochola lychnidis Schf. (7). September 19. October 24.

(To be continued.)

Collecting in the Witherslack (Westmorland) Area in 1952

By M. J. LEECH.

The article by Dr. Birkett on Lepidoptera collecting in 1952 in the January number of *The Entomologist's Record* calls to mind some of my own experiences in this area which other readers may find of interest.

Our first visit of 1952 to Witherslack was on 11th April. Having arrived we set out to choose a site for operating the mercury vapour lamp; this done we motored on to Grange for our evening meal. From here we contacted Dr. Birkett who later joined us at the scene of operations. Prior to switching on the m.v. lamp the willows were worked, from which specimens of *Gypsitea leucographa* were obtained; a female of this species laid a considerable quantity of eggs and from these a fair number of pupae resulted. Other species taken off willow included *Orthosia cruda*, *O. munda*, *O. gothica*, *O. incerta*, *O. stabilis*, *O. gracilis*, *Cerastis rubricosa* and *Conistra vaccinii*. Later in the evening at the m.v. and paraffin pressure lamps we took *Orthosia miniosa*, *Nothopteryx carpinata*, *Alsophila aescularia*, *Erannis marginaria*, *Biston strataria*, *Xylocampa areola* and melanic specimens of *Eupithecia abbreviata*. One specimen of *Nothopteryx polycommata* was seen at rest on an ash sapling but it fell to the ground and was lost in the undergrowth.

Another visit was paid to the same area on 18th April, the object this time being *N. polycommata* which we anticipated would be well out by this time. With Mr. S. Coxey and Dr. K. C. Greenwood therefore I set off for what proved to be a very interesting and successful night's work. We each took a short series of *polycommata*, which were plentiful. Almost all the specimens taken were at rest either on ash saplings or else on privet bushes. After boxing these insects we repaired to the m.v. lamp at which we took seventeen *Drymonia ruficornis*, all males, together with the *Orthosias* mentioned above. A single specimen of *Aethalura punctulata* also put in an appearance, a somewhat early

date. An unusual feature of the *Selenia bilunaria* observed, which suggests a possible retardence of emergence, was apparent in that some of the insects were only the size of the summer brood.

The next entry in my diary for this delightful spot is for 8th May. When we arrived the sky was very dark owing to heavy clouds; it looked certain that rain would stop play. As luck would have it, however, the rain held off except for a few heavy drops, and because of this, almost ideal conditions prevailed. The moths, which were quite numerous in species, did not quite come up to expectations; although we were fortunate enough to take three *Odontosia carmelita*. The method of approach of this species to the m.v. lamp is worth mentioning: all three flew in very low, clearing the surrounding vegetation by inches, and alighted on the edges of the sheet, from which they proceeded to half fly and half stumble towards the trap in the centre of the sheet. Needless to say they were boxed before they could gain admittance. Besides *carmelita* we took *Pterstoma palpina*, *Colocasia coryli*, *Anagoga pulveraria*, *Lampropteryx suffumata*, and *Chloroclysta miata*.

Ten days later we packed our gear and set off in the morning for the Silverdale area. *Argynnis euphrosyne*, *Nemeobius lucina*, and *Anthocharis cardamines* were well out. Beating the vegetation for Geometers proved productive; *Electrophaes corylata*, *A. pulveraria*, *Bapta temerata* and *B. bimaculata* were quite common. In the evening we went on the Witherslack; a temporary breakdown of the m.v. lamp meant that only car headlights and pressure lamps could be used. Nevertheless some interesting moths came to the lights, including *Dasychira pudibunda*, *Drepana lacertinaria*, *Cynia mendica*, *B. bimaculata* and *Ligdia adustata*.

A flying visit was paid on 21st May, this time complete with the m.v. equipment. The same species as already mentioned were observed with the addition of a male *Acronicta alni*, which my friend Mr. Coxey boxed just before we switched out the lamp. We had to be at work the following morning so ceased operations at 12.30 a.m. B.S.T., just when the moths appeared to be showing an interest in the light.

A long week-end followed, 31st May-2nd June, which saw us again in the Witherslack area; again I was in the company of Dr. Greenwood. Weather conditions were not by any means ideal, rain was much in evidence and the thermometer was several degrees lower than on our previous visit. In spite of this the common butterflies were flying quite freely. The moths taken at night included *A. alni*, *Apatele menyanthidis*, *Craniophora ligustri*, *Cybosia mesomella*, *Deilephila porcellus*, *Drymonia dodonaea*, *Hadena suasa*, *Anaplectoides prasina*, *Plusia pulchrina*, *Lycophotia porphyrea* (an early date), *Plagodis dolabraria* and many others. From our joint records we found that we had taken or observed eighty-two species of Lepidoptera.

Our last visit of the season was made to Witherslack on 5th and 6th September. Results were a complete reversal of those obtained on our first trip. In thirty-six hours we saw no more than eight moths. As will be remembered the weather was exceptionally cold for the time of year, clear skies at night with a bright moon. I suppose, on consideration, that we should have done better to have stayed indoors by the fireside, discussing our plans for the remainder of the season.

Butterflies at Winchester in 1951 and 1952

(Continued from page 74)

- Thecla quercus* (Purple Hairstreak): 'Clouds' of well over a hundred seen on oak trees in late July 1952, Crab Wood. No records for 1951.
- Callophrys rubi* (Green Hairstreak): Very common in Hills Valley and near Crab Wood, May-June 1951. Not so common and much earlier in 1952.
- Lycaena phlaeas* (Small Copper): Much more common in 1952 than in 1951; May till October in Hills Valley.
- Plebejus argus* (Silver-studded Blue): Several in late June 1952 at Beaulieu; a few in late July at Farley Mount, also at Woolbury Ring, including one exceptionally large female.
- Aricia agestis* (Brown Argus): Common both years in Hills Valley, May-June. Second brood rarer; July-August.
- Polyommatus icarus* (Common Blue): Scarce all the year in 1951 and first brood not common in 1952. Second brood much more common in 1952. Hills Valley.
- Lysandra bellargus* (Adonis Blue): Fairly common as first brood in both years. Second broods rarer. Hills Valley.
- Lysandra coridon* (Chalkhill Blue): Common both years. From beginning of June 1951, but not till late July 1952 in Hills Valley. A week later at Woolbury Ring, 1952. Several dwarfs.
- Cupido minimus* (Small Blue): The commonest of all the 'Blues' in Hills Valley, May-July 1951. Very few in 1952.
- Hamearis lucina* (Duke of Burgundy): Fewer and later in 1952 than in 1951. June. Crab Wood.
- Pyrgus malvae* (Grizzled Skipper): Fairly common May-June in Hills Valley. Far commoner in 1952 than in 1951.
- Erynnis tages* (Dingy Skipper): Common May-June in Hills Valley. More in 1952 than in 1951.
- Thymelicus sylvestris* (Small Skipper): Very common all July in Hills Valley and Chilcomb. More in 1952 than in 1951.
- Ochlodes venata* (Large Skipper): None recorded in Hills Valley in 1951. Very common there in June 1952.
- Hesperia comma* (Silver-spotted Skipper): Fairly common July-August 1952 at Farley Mount and Woolbury Ring.

Haworth and his *Prodromus*. II

By P. B. M. ALLAN.

Describing the *Lepidoptera Britannica*, H. A. Hagen in his bibliography of entomological works quotes Lowndes (and gives a wrong page reference: it should be vol. 2, page 1015) for the assertion that at most only 100 copies of that book are known. Lowndes' actual words are: "A very valuable work, seldom found complete, in which state it is probable that not more than from fifty to one hundred copies exist." 'Known to exist' would perhaps have been more accurate; for it is unlikely that less than 200 copies were printed. Although the collections known to, or rather inspected by, Haworth amounted only to 70 he would naturally hope that his book—a work of reference—would be read and used by suc-

ceeding generations. But the *Lepidoptera Britannica* is such a poorly produced book, a dumpy octavo badly printed on a cheap paper which to-day is invariably 'foxed', that many a copy must have been thrown by booksellers into their tuppenny box. Indeed, such-like repositories and 'junk' shops in the smaller provincial towns are the most likely places in which to find a copy to-day.

But the *Prodromus*, without any doubt at all, is now an exceedingly rare book. A little slim quarto of 28 leaves, often cut down to $7 \times 5\frac{1}{2}$ in., the text apart from the preliminary pages being for the most part in Latin and on a subject which appeals to very few book-buyers indeed, it is hardly a work which a secondhand bookseller in a back street would think worthy of putting on his shelves. Even to-day it is a book that many persons would consign to the dust-bin or waste-paper pile. Like the famous Elzevier *Le Pastissier François* it was intended to be a working tool and was treated as such by those who bought it, being thrown away when no longer required. The chance of finding a copy outside a collection of entomological books of course will always exist; but the odds against such a *trouvaille* must now be almost astronomical.

The *Prodromus* has never received the notice which it deserves by students of British lepidopterology. A reason for this neglect is perhaps that it contains a large number of specific names which are unknown to us in England nowadays. Consequently, it may be that those who have looked at it cursorily have jumped to the conclusion that the book includes a good many of those Continental species which Plasted, Humphreys, Latham, Seaman and other contemporary dealers were importing freely and foisting upon their customers as genuine British insects recently caught in Britain. Therefore, the book is worthless from the historical point of view.

This is not the case. No man was ever more zealous in the cause of British Entomology. In his Preface Haworth tells us that he has "long meditated a new arrangement, and complete account of the *Lepidoptera Britannica*, and long endeavoured to establish a *standard, permanent and complete collection of them*" (his italics.) It was only the British species in which Haworth was interested—and he if anyone knew all about the foreign importations. Every species which he had (in his own words) "not yet absolutely seen alive" is marked with an asterisk and when a species undistinguished by an asterisk bears the name of a purely Continental insect we may be quite sure that the nomenclature is at fault. This is not to say that Haworth's identifications were wrong: in his Preface he tells us that he has used the names given by Linnaeus, Fabricius, Villers, Hübner, Panzer, Lewin, Donovan and Curtis. So it is not matter for surprise if his book contains no mention of *Melitaea athalia* (a much more widespread species in Haworth's time than it is to-day) but that he himself had taken *M. dictynna*,* that *Maniola tithonus* likewise is an absentee but that *M. pilosellae* takes its place, that *Aricia idas* does duty for *A. agestis*, and so on. Miss Jermyn, who based her book on the works of Haworth and Stephens, and was assisted by the great William Kirby, gave as localities for "*M. dictynna*" two well known haunts of *M. athalia*, in one of which this butterfly still

*In the original edition this is misspelt 'diclynnna'. A former owner of the copy from which this reprint has been made had cleverly converted the l into a t with his pen. Other misprints in the original are p. 1 *cardamine*, p. 3 *maegera*, p. 5 *pinestri*.

occurs. It is, in fact, Lewin's name for *athalia*. *M. pilosellae* Miss Jermyn definitely identifies with *M. tithonus*: it is the Fabrician name for that species; *A. idas* she calls the 'Brown Argus': it is the *idas* of Lewin and Ochsenheimer.

The butterflies marked with an asterisk are:—*P. podalirius*, *P. daplidice*, *C. hyale*, *C. hero*, *A. charlotta*, *A. lathonia*, *L. virgaureae*, *S. pruni*, *M. arion*, *A. artaxerxes*, *C. cymon* (*semiargus*), *H. comma*, and *C. palaemon* (*paniscus*). With the exception of *P. podalirius* every one of these is, or is known to have been, a British insect or a well known immigrant.

P. podalirius, Haworth tells us, is "admitted upon the assurance of two of his Entomological friends, that they once beheld alive and at large" this species. Probably the specimens seen were 'escapes'. *C. hero* was most likely the ab. *philoxenus* Esper of *C. tullia*: Westwood notes that it is the *philoxenus* of Esper and not the *hero* of Linnaeus. *A. charlotta* is the well known aberration of *A. aglaia*. *Lycaena virgaureae* L. was either just extinct or dwindling to extinction in England when Haworth wrote. He possessed English specimens and so did Dru Drury, who did not regard it as rare in England, who told a friend categorically that it was English, and said that he could obtain it for him if required. Drury's English specimens of this butterfly were examined and their identity confirmed by J. C. Fabricius in 1767. Fabricius was not aware that such an insect as *dispar* existed; any question of confusing these two species can therefore be ruled out. Perhaps I may interpolate here that this insect is the subject of a chapter in a forthcoming book.

The only other butterflies in the *Prodromus* which call for comment are *Polyommatus hyacinthus* Lewin—perhaps a not uncommon aberration of the female *P. icarus* Rott.—indeed Westwood gives it as a synonym of *icarus* and adds "Haworth (variety)"; and a 'skipper' named *lavaterae*, probably an aberration of *Pyrgus malvae* since Miss Jermyn calls it the 'Scarce Grizzled Skipper'. Westwood in fact gives the *lavaterae* of Fabricius, Haworth and Jermyn as a synonym of *P. malvae*. Haworth had caught both these species himself.

So far, then, from containing Continental species the *Prodromus* is essentially an English list: the 68 butterflies which it contains are those included—with the solitary exception of *L. virgaureae*—in our modern text-books.

The footnotes to some of the rarer species are interesting. *Colias croceus* f. *helice* is called "Edusa alba" and this Haworth described as "A new and most remarkable variety, lately discovered by me in my garden". *C. typhon* (*tullia*) was "A new species in Britain, just recently captured by my very good friend P. W. Watson in Yorkshire". Of *Argynnis charlotta* he writes "A new and very beautiful species recently discovered in Bedfordshire by my friend C. Abbott, M.A." *L. dispar* has the well known note: "Hippothoe, Lewin and Donovan, not Linnaeus. A very beautiful species quite recently discovered in England by me and my very good friends W. Skrimshire and F. Skrimshire, M.D., and formerly in Wales by Hudson most famous of botanists". *A. artaxerxes* is described as exceedingly rare and found in Scotland by Fenwick Skrimshire. The *cymon* of Lewin, our Mazarine Blue (*semiargus*), also is accounted "a very rare species, just recently taken in

Norfolk by my good friend J. Burrell, M.A., and also in Yorkshire by my good friend P. W. Watson". Dr. Abbott is also made responsible for *C. paniscus (palaemon)*—"a species new to Britain lately discovered in Bedfordshire".

So much for the butterflies in the *Prodromus*. The moths are no less interesting; but perhaps I have said enough to indicate the importance of this book to all students of British lepidopterology. It should be added that the price of Mr. Classey's reprint is 15s.

Current Notes

Physiologists have shown that everyone has a blind spot and the nomenclators are no exception. In collaboration with Messrs. N. D. Riley and Roger Verity, Mr. Francis Hemming has written a paper on *Argynnis cydippe* and *adippe* Linn. in that obscure and very expensive publication, the *Bulletin of Zoological Nomenclature*. In this Mr. Hemming says that *Argynnis cydippe* is not found in Denmark and gives as his authority Dr. Tuxen.

Surely such a remarkable gap in its range required confirmation and there are several well known Danish entomologists who could have been approached. Dr. Skat Hoffmeyer tells us that *cydippe* occurs not infrequently in suitable places all over Denmark, while *niobe* is found on coastal sand dunes. The matter is of some importance because on the strength of its supposed absence in Denmark Mr. Hemming says that *cydippe* Brünnich and Müller is "certainly not the high brown" and their citation "must have been due to an error of identification; it was almost certainly a form of *niobe*".

There is, however, no doubt that these old Danish entomologists knew their own country better than Dr. Tuxen, and their *cydippe* is *cydippe* and not *niobe*. If our distinguished nomenclators had referred to the best and most modern work on the Rhopalocera of Denmark, *De Danske Storsommerfugle* by Hoffmeyer and Knudsen (1938), they would have found a list of seven localities on the mainland where *cydippe* occurs. It also flies on the islands of Zealand, Möen and Bornholm.

The Irish Naturalist for January (XI, No. 1) contains at page 16 a list of some Microlepidoptera taken in the Glengarriff area of West Cork in June 1952 by Mr. J. D. Bradley. The list contains 47 species, of which one, *Glyphipteryx schoenicolella* Stn., is new to Ireland, and one, *Coleophora teidensis* Wals. (= *gotlandica* Benander) has been recorded only once previously from Ireland and from nowhere else in the British Isles. *C. teidensis*, of which two specimens were taken, is now known from Teneriffe (three specimens, including the type), Belgium (one specimen), Gotland (one specimen) and from West and South-West Ireland. The larval foodplant has yet to be discovered.

Some of our readers may have wondered why *Ornithomya*, the generic name of *O. fringillina* (Dipt.) was spelt in two ways in the Note and Erratum respectively on page 93 of our March issue. The reason is that both are used. The authority for them is Latreille, who spelt the name in both ways. Kloet and Hincks' *Check List*, which

gives them both, allots precedence to *Ornithomya*, which was used by Latreille in 1802 whilst *Ornithomyia* dates from 1805.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Platyptilia gonodactyla Schiff. The larva of the first brood of this moth may be found inside the flower-heads of colt's-foot towards the end of April, clearing out the pith. The flower-heads should be collected when the seeds are fully formed and the head surrounded by the fluffy seed-wings, like that of a dandelion. They should be cut about two inches below the head as the larva works about the upper part of the stem at times, and the moth may easily be reared by emptying the heads into a breeding-cage. *P. gonodactyla* varies very greatly and is seldom captured in quantity or really good condition, whereas a bag of colt's-foot heads from any rough ground is sure to produce a fair number; I have never collected a bag-full in vain.

Platyptilia isodactyla Zell. The full-grown caterpillar of this plume may be found in the large rosette leaves of *Senecio aquatica* at the end of April, living on the underside and slightly puckering the leaves by a few threads. It is easy to rear and not uncommon where found at all, whereas the sluggish moth is seldom seen. It is found in many of the Broadland districts and other marshes in East Anglia. I found it near Lowestoft and the late Sir John Fryer near Southwold. It is probably found in many localities from which it is not recorded at present as the larva has seldom been looked for and the moth only flies for a short time at dusk, though it may occasionally be disturbed in the daytime.

Tortrix postvittana Wall. The larva of this rather pretty introduced species may be found spinning in the young shoots of *Euonymus japonica* in garden hedges in its own localities (Newquay, etc.) in late April. So far it has not turned out the pest it was feared it might prove when first discovered, and it seems possible it cannot stand the English winter except in the far west. At the same time it is advisable to keep all larvae in boxes from which they cannot possibly escape and to kill every moth bred to prevent its possible introduction elsewhere. When Fryer sent me a supply of caterpillars in 1940 he did so on these express conditions.

Eucosma pauperana Dup. When is this insect again to be captured in England? A hundred years ago it was taken on warm days about April 15th-25th in lanes near Darenth, and fifty years ago under the same conditions near Boxhill. It was beaten from wild rose bushes on warm afternoons and was apparently not uncommon, as Bower, who discovered the Boxhill locality, told me he had often seen a dozen in one day. It seems to have disappeared from Darenth by 1880 and from Boxhill considerably later. The late A. Thurnall told me he had never had any difficulty in taking it at Boxhill before 1914 but in 1924 he went there to get me a set and saw none. He subsequently drew me a map of the place but I also totally failed to find it, and as Mr. L. T. Ford was equally unsuccessful I presume it is no longer there. In the early 'thirties it was taken near Cambridge and the late W. S. Gilles

and myself two years later visited the place on an ideal day but saw none. I should not despair of finding it anywhere on the chalk on the right day at the right time of the year.

Eucosma nisella Clerck. As my series of *Citria lutea* Stroem. was over forty years old and consisted of caught damaged specimens I collected about a pint of male sawfly catkins in mid-April 1952 on Danbury Common and put them on well-drained earth in a large flowerpot. They were mostly fallen catkins from under the bushes, and from them I bred 22 *C. lutea*, 9 *C. icteritia*, and a number of *Eupithecia tenuiata*. I also bred, rather to my surprise, one *Agrochola lota* and one *A. circeularis*; but the commonest insect was *Eucosma nisella*, of which there were about 40, in endless variety and of great beauty. The larvae of all these required no care: I simply chucked the catkins into the pot and left them under a muslin cover in the garden.

Practical Hints

In an 'early' year *Hemaris tityus* may be expected at the end of April. We have caught a worn specimen on the 29th. The places in which to look for it are damp spots (whether on high ground or low) carpeted with devil's-bit scabious and lousewort—though this plant is not in bloom usually until well on in May. The moth is very easily seen at a distance of twenty or thirty yards, and a good plan is to move quietly well ahead of the direction in which it seems to be feeding, then stand stock still and wait. In this way we have had them come right up to our feet. Strike downwards with the net, then raise the bottom of the bag with your hand, and the moth will fly up into it. We have also taken this species flying at *Scilla nonscripta* (bluebell).

When feeding on birch—and we have found it more often on birch than on any other plant—the handsome larva of *Trichiura crataegi* has a curious habit of sudden activity. Usually they are found resting motionless on the twigs of birch bushes, invariably on the sunny side; but sometimes half a dozen fairly close together will suddenly start to crawl about very actively. This movement of course at once catches the lepidopterist's eye. For many successive years we collected these larvae from birch, and our diaries do not record a single one being ichneumonated. But perhaps this is merely fortuitous. We have found second instar larvae on 23rd April.

Polyphoca ridens is now emerging and so are *Drymonia ruficornis* and *Odontotia carmelita*. *P. ridens* rests by day on an oak trunk, and as it often selects a background of green alga it is exceedingly difficult to find. Still, it ought not to escape the eye of the practised field worker. *D. ruficornis* we have found only once in the imaginal stage: it is even more difficult than *ridens*; probably it usually rests fairly high up on the bole. All who want to take *O. carmelita* should read Mr. Symes' paper on this species in our issue of last December (*Ent. Rec.*, 64: 337) and lose no time in searching the trunks of birch trees. Probably none of these three moths is really 'local' and can be expected in any wooded and open wooded district within their distributional range.

Notes and Observations

THE EARLY SEASON.—Is not 1953 showing signs of being a remarkable season? On 21st February the m.v. lamp in my garden here, lit for the first time in 1953, attracted sixteen different species of macro-lepidoptera. *Theria rupicaprararia* Hüb., *Erannis marginaria* Borkh., *E. leucophaearia* Schiff., *Phigalia pedaria* Fab., *Apocheima hispidaria* Fab., *Conistra vaccinii* L., *Eupsilia transversa* Hufn., *Scoliopteryx libatrix* L. and *Alsophila aescularia* Schiff. were all more or less expected. But *E. defoliaria* Cl. in good condition was certainly late, and *Achlya flavicornis* L., *Orthosia gothica* L., *O. cruda* Schiff., *O. stabilis* View., *O. incerta* Hufn. and *Ectropis bistortata* Goeze were astonishingly early. The following night there appeared additionally *Xylocampa areola* Esp. and *Biston strataria* Hufn. All this is encouraging after the disappointments of last autumn with its early and continued cold weather.—R. M. MERE, Mill House, Chiddingfold, Surrey. 24.ii.53.

SPHINX LIGUSTRI L. BREEDING IN NORTH NORFOLK, 1952.—According to South (*The Moths of the British Isles*, 2nd ed., 1: 34) and Allan (*A Moth-Hunter's Gossip*, 1937, 2nd ed.: 19-20) the Privet Hawk is rare in all but the southern part of England; the latter author, indeed, classes it among our non-resident hawk-moths and suggests that it is less common than often supposed, breeding regularly only in sheltered localities along the south coast. It may therefore be worth mentioning that at the beginning of last September I received through the post a live and healthy pupa of the species, which had just been found—presumably in digging—in a garden at Wells-on-Sea, N.W. Norfolk, where I had been staying the week before. (Identification was easy, from the size and the short external proboscis-sheath.) This of course proves breeding on the spot, though the parent moth could have been a casual immigrant or a chance introduction from local shipping; one wonders whether collectors in that part of the country have met with *S. ligustri* during the past season. Incidentally, the pupa was sent almost loose in a tin and must have been mercilessly bumped and shaken in the course of its journey; it is now being cared for by a lepidopterist friend, and whether it will survive the effects of its ordeal and come duly to full moth-hood remains to be seen.—A. A. ALLEN, The Tiled House, 63 Blackheath Park, London, S.E.3. 12.ii.53.

A HYBRID SWALLOWTAIL.—In the paper on the hybrid *P. asterias* ♀ × *P. machaon* ♂ (*Ent. Rec.*, March 1953) mention was made of the reciprocal cross, *P. machaon* ♀ × *P. asterias* ♂. This has now been obtained and both male and female butterflies essentially resemble the original cross, being like *asterias* but showing certain *machaon* characteristics. It is hoped to publish a more detailed account of the butterflies in a later issue.—C. A. CLARKE, High Close, Thorsway, Caldy, Cheshire.

THE PUPATION HABITS OF GONIMABRASIA TYRRHEA CRAM. (LEP. SATURNIIDAE).—In the middle of November 1950 we found the larvae of this species swarming in countless thousands on common Karoo thornbush *Acacia karoo* which abounds along the dried up streams throughout the Karoo semi-desert in South Africa. In confinement they fed up well on other species of *Acacia* and in due course burrowed into the sand

to the depth of about four inches. Some three months later I went through this sand and was somewhat disappointed to find scores of what appeared to be dead and "mummified" larvae which I was on the point of throwing out when I noticed a perfectly formed pupa through a piece of torn larval skin. This species does in fact change into the pupal state within the skin which entirely covers the pupa. Subsequent examination of my "throw-outs" proved that the majority were in fact living and they hatched successfully the following year. I wrote to Mr. J. Sneyd Taylor of Fort Beaufort who made the following observations:—"The pupating habit you mention does not seem to have been recorded as a feature in itself, but it appears to be general in the Saturniids which pupate in the soil. I found it in both *Bunea alcinoe* Stoll and *Gynanisa maia* Klug, as well, while it occurs in *Nudaurelia cytherea* Fabr. and doubtless other species also. The pupae survive for as long as ten months in this condition. It is certainly worth writing up and it is strange that no local entomologist has ever thought of it." This habit is without doubt another method of protection against excessive dehydration in the drought which normally would extend over the greater part of the pupal period. The skin is thick and leathery and forms quite a substantial covering.—Dr. H. B. D. KETTLEWELL, c/o Post Office, Fish Hoek, South Africa. 26.xii.52.

INSECTS AND ALTITUDE.—Often enough there are interesting records of captures of Lepidoptera in the correspondence column of *The Field*, but the daily press is hardly the place where one would look for serious factual records of scientific interest. Under the heading "Flying High" there is a note in the Londoner's Diary in *The Daily Telegraph* of 6th November that is well worth reproducing. 'Peterborough' writes as follows:—

"My recent story of a housefly which appeared to suffer no inconvenience when taking off inside an unpressurised plane at 10,000 ft. has brought me a great number of rival claims. One correspondent saw a fly in full possession of its faculties at 18,000 ft., though its flying controls became erratic at 20,000 ft. Another fly became torpid at 30,000 ft., but recovered when the plane descended to 25,000. These records are dwarfed, however, by a correspondent who used to test instruments at very low pressures during the war. He noticed flies emerge apparently unharmed after being for several minutes in a vessel whose atmospheric pressure was ten millibars. This is equivalent to a height of at least 20 miles or 105,600 ft. Wasps, adds my informant, died under such conditions."—M. B. 23.xi.52.

COMMITTEE FOR THE PROTECTION OF BRITISH INSECTS.—At a recent meeting this Committee was glad to learn that Mr. Ellis, of the Castle Museum, Norwich, was taking over responsibility for Surlingham Broad, which, largely through his own generosity, had been acquired by the Norfolk Naturalists' Trust. It was here that an attempt was made in 1949 to establish a colony of *Lycaena dispar* owing to doubts having arisen about the survival of the Wood Walton colony, because of the increasing dryness of the Fen. Flooding, after the larvae have emerged from hibernation, proved a handicap, however, and it is doubtful if the insect could survive there. A search is being made for a more

promising area. At the same meeting the Committee had before it an account of a very thoroughly organised attempt to rear *Maculinea arion* in captivity. Unfortunately the first attempt was not successful, but it is hoped that the experience gained may lead to better results at the next attempt.

At the same meeting reports concerning conditions in various woodlands of special interest to entomologists were considered. Some of these, as in fact often is the case, proved to be erroneous. The situation at Ham Street Woods, Blean Woods, Leigh Woods, and the Black Wood at Rannoch is reviewed constantly, and reports checked with the Forestry Commission, whose officers everywhere are, in the experience of the Committee, always most willing to co-operate, in so far as this does not bring them into conflict with the Commission's policy. There is good reason to hope that this co-operation may become even closer before long, and it is undoubtedly more fruitful than hostile criticism of the Commission's activities.

At the public enquiry into the War Department's claim to the use of a large part of Braunton Burrows, the views of the Committee were represented, in the hope that the interests of entomologists in this area could be safeguarded. It is believed that as a result of the joint protests made by numerous interests, a large part of the southern area of the Burrows will be excluded from the operations of the War Department, who will also take all practicable measures to protect the dunes in the area of their operations.

These few examples of the recent activities of the Committee are referred to in this brief note to illustrate the various kinds of questions that come before it. It is always ready to help where it can, "on information received".—N. D. RILEY.

THE LEPIDOPTERA OF CHESHIRE AND NORTH WALES.—I am preparing a list of the Tortricina found in the counties of Cheshire, Flint, Denbigh, Caernarvon, Merioneth, Montgomery, Anglesey and Radnor. This will be published in the *Proceedings* of the Chester Society of Natural Science, Literature and Art. I should be grateful if readers who have collected in these counties would send their lists to me, at the address given below. Mr. S. Gordon Smith has asked me to say that he would much appreciate lists of the macrolepidoptera found in the same counties, sent to him at Estyn, Boughton, Chester.—H. N. MICHAELIS, 10 Didsbury Park, Didsbury, Manchester, 20. 10.ii.53.

SIMULIID FLIES AS VECTORS OF ONCHOCERCIASIS.—On the 2nd April 1952 at a meeting of the Royal Entomological Society of London Dr. D. S. Bertram made an important communication on Onchocerciasis (*Proc. R. ent. Soc. Lond.* (C.) 17: 12). This disease is caused by a parasitic filarial worm which in the adult stage frequently enters the eyeball of man and causes blindness, and in some parts of Nigeria the incidence of this is high. The minute microfilariae congregate in the peripheral blood vessels and infect the biting black-fly *Simulium damnosum*. After a stage of development in the fly they are transmitted by its bite to other human beings. The larvae and pupae of the *Simulium* live attached to rocks, stones, and other fixed objects in swift streams and rivers, and in consequence fishermen are particularly liable to contract the disease and the more elderly are especially likely to become blind.

Simulium damnosum occurs in a broad belt of territory which runs eastwards from the West of Africa and includes the Niger and part of the Nile and their tributaries.

In the hilly region of Kenya near Lake Victoria, however, the vector is *Simulium neavi*, a species discovered in 1911 and proved to convey the disease in 1940. In spite of intensive search competent entomologists working between 1940 and 1950 failed to find a single larva or pupa, and it became apparent that the life history must differ from that of *S. damnosum*; but it was not until March 1952 that Mr. J. P. MacMahon solved the mystery. He made the surprising discovery that both the larvae and pupae of *S. neavi* are not attached to stationary objects but to a common freshwater crab.—ED.

THE BRITISH ORTHOPTERA.—I was most gratified to note, in the February issue (*Ent. Rec.*, 65: 48-49), the plea for more orthopterists in this country and I would fully endorse the necessity for work on this group. One would have thought the fact that the Orthoptera and their allies are so meagre in British species might have led more entomologists to take an interest in them, but it appears to be the contrary—there are so few that it seems to be not worth while bothering about this Order. I have even heard it said that there is little or nothing more to be learnt about British Orthopteroids! This is so far from the truth as to be almost heresy, for there are very numerous ecological problems to be solved, life-histories to be investigated, and perhaps even new species to be discovered.

As far as our knowledge of the distribution of these insects is concerned we are still abysmally ignorant about Ireland* and some parts of Scotland, and central Wales especially, although the position is not now quite so bad as Dr. Burr's book would suggest. But Radnor and Montgomery are still without records. Shropshire, of those counties singled out for mention, is now better known than it was; but there is much to be learnt about this and many other English vice-counties, to say nothing of those of other counties of the British Isles. May I, however, draw readers' attention to the recent summary of the distribution of British Orthopteroids printed in *Trans. Soc. Brit. Ent.*, 11, pt. 8?

Might I add that I shall be most happy to assist any correspondent in any way I can to further our knowledge of these Orders, and may I conclude with a plea that students of other Orders should not despise the Orthopteroids as unworthy of attention and should help by taking an interest in these few most interesting British insects, if only in recording their distribution or passing on information?—D. K. McE. KEVAN, University of Nottingham, School of Agriculture, Sutton Bonington, Loughborough, Leics.

*The *Irish Naturalist* for January 1953 (XI, 25) records three specimens of *Mecostethus grossus* (L.), 2 ♂♂ and a ♀, in two localities in County Cork in August and September 1952.—ED.

COLEOPTERA

DROMIUS INSIGNIS LUCAS (CARABIDAE) UNDER BARK: AN UNUSUAL HABITAT.—This uncommon species, better known to most of us as *D. vectensis* Rye, is not reckoned among the subcortical members of the genus, the normal biotope being terrestrial—it occurs mostly at roots

of herbage, under rubbish, in cracks of banks, etc., near the coast or tidal rivers, like its commoner congener *D. notatus* Steph. (= *nigriventris* Thoms.). It was surprising therefore to find an example under bark on a large log of ash—one of many logs piled up in a timber-dump in Ham Street Woods, E. Kent—in autumn, 1950. It is probable, of course, that the beetle was a stray; one would hardly expect it to breed in these woods, and the timber might have come from some distance. Owing to the situation the insect was at first mistaken for the truly subcortical *D. 4-signatus* Dej. (a rarity which I have so far met with only once—in Windsor Great Park, Berks.). *D. insignis* is more particularly a Kentish species, and it may be added that when Dr. A. M. Massee and I were collecting on the shingle-flats near Dungeness (the southernmost point of the county) in June last, Dr. Massee captured a pair of it in breaking open old dead stumps of broom. I had previously taken a few specimens in the Isle of Grain (Thames Estuary district).—A. A. ALLEN, The Tiled House, 63 Blackheath Park, London, S.E.3. 12.ii.53.

DIPTERA

The Hover-flies (*Syrphidae*)

By L. PARMENTER, F.R.E.S.

The bright yellow and black bands of so many species and their habit of visiting flowers, together with their characteristic hovering, make this family of flies one of the best known. Gardeners have additional cause to know them for the larvae of the genera *Merodon* and *Eumerus* attack our bulbs. But the majority of the garden frequenters are more welcome, for their grubs feed on green-flies. With entomologists, the family ranks high because of the variety, of form and coloration, of larval types and of habits. The colour patterns are of particular interest in view of the apparent mimicry of bees and wasps.

The Hover-flies are a large family, distributed throughout the world. Many of the species found in the British Isles also live in North America. Some are known also in Japan and *Eristalis tenax* L. has gradually extended its range and is now resident in all the continents, where it first colonised the immediate vicinity of the ports.

The genera *Criorrhina*, *Eristalis*, *Helophilus*, *Merodon*, *Milesia* and *Volucella* have been found in amber.

In March, a few flies of the genus *Chilosia* and *Melangyna quadrimaculata* Verr. appear and are followed by the successive emergences of some 250 species and named varieties in this country, with a gradual lessening of numbers and of species until October. By then, possibly only an odd *Eristalis tenax* L. remains, perhaps tempted into the open by warm sunshine. From November to February, one may occasionally see a Syrphid for in mild winters, at any rate, a few overwinter. Those seen about in February are generally darker in colour than the normal and in the case of *Syrphus auricollis* Mg. the variety has been given a name—*nigritibia* by Rondani.

Of the Syrphidae found in Britain, Linnaeus knew 27 species in 1758. The family has been studied by many systematists and biologists since then, both in this country and abroad. In the British Isles, the pub-

lication by G. H. Verrall in 1901 of his first volume on British Flies, and by choosing the Syrphidae as one of the first three families to be monographed, emphasized their attraction. It is from 1901 that general interest in the family has grown. At first, possibly by Verrall's own restriction of life history notes, attention was concentrated on distribution. But gradually more and more interest has been taken in the early stages aided by the careful work of the American writers Metcalf and Heiss, who dealt with several of the species that are also found in our land.

The average newcomer to entomology is not a fluent linguist and to be tempted from the well trodden paths of the lepidopterist requires his literature to be in English, to enable him to recognise and put a name to all his captures. He needs some encouragement to study by the provision of notes on the life histories of the insects. Lundbeck's volume on the family in his *Diptera Danica* series, written in English, is still available at a modest price. Now that Verrall's volume is out of print and so expensive when available second-hand, Lundbeck's work is the best means of getting to know the Hover-flies. Moreover his shortened but adequate descriptions and above all the details of habits and habitats, render his book all the more attractive. However, it by no means covers all the species known from Britain. Verrall's 1901 list has been increased by the studies of his nephew, Mr. J. E. Collin, our leading British dipterist, but the published descriptions of his additions and those of others are scattered in various journals, etc. Also the family has had the attention of the nomenclature specialist, and the late E. R. Goffe, by his acceptance of certain Meigen names of 1800 and of certain generic conceptions of Matsuma and Shannon, led to the revised list of the Syrphidae published in Kloet and Hinck's *Check List of British Insects* in 1945. These names have been widely used but it is believed that in the Syrphidae part of the Royal Entomological Society's Handbooks, Mr. R. L. Coe will be reverting to Verrall and Collin's usage of names. As Mr. Coe's keys will become the accepted basis for identification, I have therefore used Verrall's names in this paper.

The systematics of the family still need further study. Mr. Coe has already advocated some 'lumping' of species. Many flies have already been found to be localised so that they may well be further species to be discovered in Britain. Messrs. Collin and Coe have given us fine examples of the type of work required. As to life histories of the early stages, Mr. Coe's studies of *Rhingia* and *Callicera* set a very high standard and a lead for other students, whilst a perusal of Hennig's third volume will show the small number of species of whose early stages even a little is known.

RECOGNITION.

The beautiful coloured and black and white drawings by Mr. C. O. Hammond in Colyer and Hammond's *Flies of the British Isles* will enable all to quickly recognise the members of the family. The presence of a false vein lying between the 3rd and 4th longitudinal wing-veins is confined to this family and once recognised, is infallible.

There are often few bristles on the legs and body. In fact, generally, bristles are absent. The frontal sac that is used by the majority of the Cyclorrhapha (the sub-order in which the Syrphidae are placed) when emerging from the pupa, is absent. Another character is the unsym-

metrical genitalia of the males. In the majority of the genera, but sometimes differing within the genus, the compound eyes of the males meet and in the females are separated by the frontal stripe. They are strong flyers, nearly all hover and visit flower blossoms.

IDENTIFICATION.

At the time of writing the most comprehensive work in English dealing with the identification of the Hover-flies of Britain is *British Flies*, VIII, by G. H. Verrall, 1901; *Diptera Danica*, V, by W. Lundbeck, 1916, deals with a large number of British species. Both are illustrated. Since 1901 there have been a number of papers dealing with additional species. These have been listed up to 1949 by H. W. Andrews in supplements to this JOURNAL—*British Dipterological Literature*, Parts I-IV, 1931, 1935, 1943, 1949 (Obtainable from our Treasurer). Shortly to appear will be Mr. R. L. Coe's keys to the Syrphidae in the *Handbooks of British Insects*, to be published by the Royal Entomological Society.

Both Verrall's and Lundbeck's volumes are available to members of several entomological societies and can also be borrowed through local municipal libraries from the Central Library for Students. It is hoped that Mr. Coe's keys will be available at a price suitable to all students.

The foregoing works deal with adult insects. The descriptions of immature stages are not numerous and are very scattered, generally in foreign literature, often difficult of access in this country. There is a great need for a comprehensive work dealing with this aspect. More studies, however, are needed before anything like an adequate account can be given.

As for illustrations, there are 19 species depicted in colour with 18 more in black and white and two types of larvae figured in Colyer and Hammond's *Flies of the British Isles*. These are undoubtedly the best yet published. Excellent illustrations of eggs, larvae and pupae are found in the papers of R. L. Coe, E. M. Heiss, W. E. H. Hodson, C. L. Metcalf, and E. I. Scott.

DISTRIBUTION.

Audcent found 177 species in his Bristol area whilst on a wooded Surrey common (Bookham) I have found 101 species. So it will be seen that the family is generally distributed. Hover-flies are strong flyers and in summer visit the centre of towns. In London, the bombed and flattened area of Cripplegate is visited by several species, some staying to breed. Florist shops and fruit barrows of busy streets such as Oxford Street, at times have species of *Eristalis* and *Syrphus*. Once in Grosvenor Square, near the Roosevelt Memorial, a *Myiatropa florea* alighted on my hand in the sunshine and stayed awhile.

Our garden flower-beds attract various species who wander up and down, sipping nectar or collecting and eating pollen, and pass on. *Chrysotoxum*, *Eristalis*, *Helophilus*, *Melanostoma*, *Merodon*, *Platychirus*, *Syritta* and *Syrphus* are among the genera sending regular visitors. Some leave their eggs, but of these more anon.

Along the hedgerows, with the wayside flowers and lush grass edging the damp ditches, other genera as well as the garden visitors are attracted. If the hedgerow includes trees in its composition or edges a copse or wood, the shade or partial shade-loving species such as certain

species of *Syrphus* and *Volucella* are found. Some Hover-flies breed in rotting wood and therefore require old trees in the habitat. Others breed in liquid mud and stagnant water and need to live about marshes, lakes and sluggish streams. Sand dunes are visited but no species seems capable of breeding there.

Sewage farm fields, rot holes in trees, sap exudations on trees, certain plants and the nests of various insects are the chosen breeding habitats of particular species. The flies will therefore be found in the vicinity for oviposition and on emergence. For feeding, the flies may wander quite a distance, and most of the Hover-flies are found visiting flower blossoms. For courtship and mating there are often other requirements. At times, coupling is attempted by males with females as the latter are feeding on the flowers. In other species the males will hover in shafts of sunlight in woodland rides and will drop on passing females. Thus *Rhingia* will wander far for feeding but the females are bound to return to cattle pastures for oviposition.

DISTRIBUTION—LARVAE.

The habits of the larvae of Hover-flies are varied. A large majority feed on aphides and are therefore found on the plants attacked by green-flies. These genera include *Baccha*, *Catabomba*, *Didea*, *Paragus*, *Pipiza*, *Sphaerophoria* and *Syrphus*. Another group of genera have larvae living in rotting wood such as *Brachypalpus*, *Chrysotoxum*, *Malloia*, *Myiolepta*, *Pocota* and *Xylota*. In stagnant water or mud are larvae of *Chrysogaster*, *Eristalis*, *Helophilus*, *Neoascia*, *Orthoneura* and *Sericomyia* and in rotting vegetation—*Syrretta*. *Chilosia* larvae have been recorded living in fungi and in the roots of thistles. In bulbs of Daffodils and others, most of us have bred, generally without desire, species of *Merodon* and *Eumerus*. The sap flowing from trees is the home of the larvae of *Brachyopa* and *Chrysochlamys*. The larvae of *Volucella* are found in wasps' nests whilst *Microdon* inhabits ants' nests. The larvae of some genera are still unknown, for example, *Leucozona*, *Ischyrosyrphus*, and *Melangyna*.

EGGS.

All the eggs that I have seen and those described in the literature are white, elongate oval, with the micropilar end blunter than the opposite one. The shell is sculptured, each genus and probably each species having a characteristic pattern formed by microscopic elevations with narrow channels in between.

OVIPOSITION.

This varies according to the genus and the larval habitat. In the species with aphidophagous larvae, the eggs are generally laid singly among or on the aphides but sometimes on the leaves or stem of the plants that are usually attacked. Whether the eggs of aphides are present in these latter cases or whether there is any other attraction I have no knowledge. Nixon has recorded that *Volucella pellucens* L., which in no way resembles a wasp and is much larger, entered nests of *Vespula vulgaris* L. and *Vespula germanica* F. No notice was taken of the fly by the wasp in either case. In one instance 58 eggs were laid in twos and threes. I have seen several adult *Microdon eggeri* Mik enter an ants' nest without being attacked.

In *Rhingia*, eggs have been found in large clusters on grasses overhanging cow-pats. Coe has recorded a female laying 108 eggs on three leaves, 86, 16 and 6 on each. In *Melanostoma* and *Platychirus* the eggs are said to be laid in batches of four or five and in *Syritta* and *Tropidia* in masses of a hundred or more. *Eristalis* lays eggs in groups of 50 or so.

With *Merodon equestris* F., the large bulb fly, the female backs down the hole left by the rotted leaves and stem and lays a single egg on the bulb, but up to five have been found, each laid on different dates, probably by different females. *Eumerus tuberculatus* Rond., the lesser bulb fly, lays the eggs in small batches on the bulb, on dead vegetation attached to the bulb, and at times, on the ground and on vegetation about the bulb. As many as 200 larvae have attacked a single bulb so it will be seen that the smaller species of *Eumerus* are more prolific than the large *Merodon*.

The females of *Melanostoma mellinum* L. have been seen to oviposit under the lower leaves of herbaceous plants close to damp ground. *Sphaerophoria* and various species of *Syrphus*, likewise lay their eggs on the underside of leaves. This shelters them from dessication by the sun and places them amongst the aphides also sheltering and feeding on the underside. *Syrphus balteatus* Deg. I have watched laying her eggs under the lower leaves of cabbages but in *Catabomba* I have observed the eggs, at times, laid among the aphides on the stem of the chosen plant. This suggests that the aphides are more attractive than shelter from the sun.

Probably the females of most species of Hover-flies carry some 100-250 eggs. Gravid females that I have carried home alive in small collecting tubes have laid eggs in batches in the tube. I have counted over 120 from *Eristalis*, *Volucella* and more than one species of *Syrphus*. In one case of *Syrphus nitidicollis* Mg. laid 346 eggs. Where females have been dissected, up to 200 eggs have been found. More data is needed and could be fairly easily acquired and published.

(To be continued.)

Current Literature

THE GENERIC NAMES OF THE BEETLE FAMILY STAPHYLINIDAE; WITH AN ESSAY ON GENOTYPY. By Richard E. Blackwelder. 8½ × 6 ins., iv + 481 pp. Smithsonian Institution, Washington, 1952. Price \$1.50. (Bulletin 200 of the United States National Museum.)

In the author's words (p. 3) 'the sole purpose of this work is to present in uniform manner the facts of establishment and subsequent use of all names applied to genera and subgenera of Staphylinidae'. The principles and methods of genotypy and its elaborate ramifications are fully discussed in an introductory essay, with an explanation of the scheme adopted for the list. The latter is alphabetical and comprises even the numberless mostly unintentional misspellings found in the literature. Under each entry are clearly set out all the appropriate facts which for valid names include original reference, genotype history, synonymy, homonymy, variants, and any remarks that the case may call for. Then follow an appendix of the doubtfully Staphylinid genera, a schematic list to show at a glance the changes involved, a list of the new names proposed, and a full bibliography.

What C. E. Tottenham has done for the British Staphylinidae, Blackwelder has done for the whole family. Experts tend to disagree in their special fields, but here the difference is much more in viewpoints and methods than in actual results, and Tottenham's contribution is both commended and criticized. The author has sought to minimize the subjective element by interpreting whatever is ambiguous or unclear in the Rules in an objectively mechanical way. This demands an uncompromising, even heroic, attitude to the muddles caused by changing well-established names in the interests of eventual stability (concerning which, however, some of us feel a little dubious). It is strange to find *Cryptusa* M. & R. listed as a synonym (cf. Steel, 1948, *Ent. mon. Mag.*, **84**: 179, 180); but in general, errors seem very few and every effort has been made to ensure accuracy, completeness, and clarity. Mr. Blackwelder is to be congratulated on the fulfilment of an immense task, and his work will be invaluable to all specialists in this unwieldy, difficult, and nomenclaturally confused family of Coleoptera.—A. A. A.

ENTOMOLOGISCHE BERICHTEN No. 332 (1 February 1953) contains (pp. 216-219) an account by B. J. Lempke, with map, of the spread of *Araschnia levana* L. in the Netherlands. This butterfly began to colonise Holland about 1920, at first in small numbers, then more freely, the insect ranging chiefly northwards and westwards. In 1945 populations and distribution increased considerably. At present the insect appears to be stabilized and is maintaining itself in all its habitats, though, of course, numbers vary according to the season. As a rule there are 3 generations and Lempke suggests that it is the summer generation chiefly, or perhaps exclusively, which increases the species' range. Our readers may remember that this butterfly was successfully introduced into the Forest of Dean, Gloucestershire, some years ago, the colony unfortunately being destroyed by a misguided collector.

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

THE TIME OF APPEARANCE OF *ASTHENA BLOMERI*.—I am much obliged for Mr. Bower's answer to my query as to the time of emergence of *Eupisteria heparata* in the southern counties, and for his list of dates. . . . It is most constant in its appearance here towards the end of May and by mid-June is over. *Asthena blomeri* also seems to appear much later in the midlands than here. I have seen it in plenty at Sledmere, on June 7th, but never later than the first week or two in July. Whilst visiting Mr. Woodforde at Market Drayton, I saw some, apparently fresh, on July 28th, and I believe Mr. Woodforde said that the species was not really over, so that evidently these two species emerge much earlier in this part of the country than in some others.—S. WALKER, York.

DATE OF APPEARANCE OF *TAPINOSTOLA ELYMI*.—I can corroborate Mr. Musham's observations as to the emergence of *T. elymi* on the Lincolnshire coast about the middle of June, as, on the only occasion on which I have come across the species—at Mablethorpe, on June 19th, 1896—I found it so abundant that I took fifty specimens during that one night.

They were mostly quite fresh, but a few of them must, from their condition, have been out a week or ten days.—G. H. RAYNOR.

Obituary

KENNETH GLOYNE BLAIR, D.Sc., F.R.E.S., who died on 11th December last, was the eldest son of the late W. N. Blair, for many years engineer to the St. Pancras Borough Council. Dr. Blair was born at Nottingham on 22nd December 1882 and so was within a few days of his 70th birthday. Educated at Highgate and at Birkbeck College, London, he entered the Civil Service in 1901 or 1902, serving for a few years in the offices of the Paymaster General and of the Supreme Court but transferred in 1910 to the British Museum (Natural History) as an Assistant. At the Museum his main duty was to look after a large part of the enormous Coleopterous collections from all parts of the world consisting of some 75,000 to 80,000 species. Notwithstanding the magnitude of his task he acquired a good knowledge of the vast collections and was always ready with help and advice for any serious enquirer. From time to time he published a number of notes and revisionary papers in various periodicals at home and abroad. Dr. Blair was a man of wide interests in geology, bird life, plants, insects of all orders, and in spite of his preoccupation with the Coleoptera he found time to publish many notes and papers on other Orders and subjects. On the outbreak of the 1914-18 war he enlisted in the Seaforth Highlanders, served with his regiment in France and was discharged as no longer fit for service in 1917. His experiences during this period so undermined his health that he never fully recovered although he persevered with his work at the Museum and continued to publish faunistic reports, papers and notes, bringing his total of these to some 200.

Blair became a Fellow of the (now Royal) Entomological Society of London in 1904 and was its President in 1940-1. He was elected a Special Life Fellow in 1944. In 1911 he joined the "South London", becoming its President in 1920-1 and again in 1931. In 1950 he was made an Honorary Member and served for many years on its Publication Committee. In 1923 he was appointed to the Editorial Board of *The Entomologist's Monthly Magazine* and was a valued member of that body up to the time of his death.

In 1932 he became a Deputy Keeper in the Department of Entomology at the Museum and in 1933 took his degree of Doctor of Science at the University of London. Failing health compelled his retirement in 1943 and soon afterwards he moved to Freshwater in the Isle of Wight. In spite of the handicap of ill health he retained his wide interests right up to the end and during the last few years of his life was able to add a few new records to the Island list and several species new to Britain, notably "Blair's Wainscot" (*Sedina büttneri* Her.), "Blair's Mocha" (*Cosymbia pupillaria* Hüb.) and the "Stone Pinion" (*Lithophane lapidea* Hüb.).

Blair was a man of great modesty and kindliness, of charming personality and undaunted cheerfulness. He will be greatly missed by his many friends. In 1919 he married Lois Celia Lambert and to her and to their two daughters our deepest sympathy is extended.

C. N. H.

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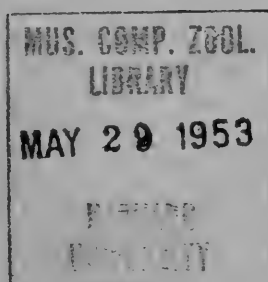
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The Habitats of *Pararge aegeria* L. in Southern England

By D. F. OWEN.

Most text books on British butterflies state that *Pararge aegeria* is a woodland butterfly, where it mainly frequents shady rides and thickets. During recent years there have been numerous references to the extension of range of this species and in some of these the authors have commented that the butterfly is no longer confined to shady places. The present note is largely to stimulate others to record information on the habitats of this species and at the same time I have brought together some of the data already available.

During the past sixty or seventy years *aegeria* has undergone a series of remarkable variations in range, having in many areas been common, scarce (or absent) and common again. Early in the present century there was a general contraction from the east and north and the species became isolated in the west of Scotland. This was later followed by an expansion of range back into the original areas, but there is some evidence that the northward movement has not yet got under way. The history of this range variation has not been published in full, but has been briefly discussed by Ford (*Butterflies*, 1945) and his account has been followed by papers on the history of the species in Scotland (Downes, *J. Animal Ecol.*, **17**: 131-138) and in Kent (Chalmers-Hunt and Owen, *Entom.*, **85**: 145-154).

I had previously thought that the expansion of range of this species could in some way be correlated with the apparently recent adaptation to habitats other than those described in the text books. However, this hypothesis must now be modified in view of recent information about the habitats of the butterfly in the west country. Thompson (*Ent. Rec.*, **64**: 161-166) has found a race of *aegeria* in the mountains of North Wales. Here it inhabits the bare slopes well away from trees and bushes, and also is morphologically separable from the lowland form. Moreover it is single brooded, whereas normally the butterfly has two, often three, broods in a year. There is also considerable evidence that in Cornwall, Devon, Somerset and possibly other counties in the west, *aegeria* is not confined to woods, but flies abundantly in other habitats. For instance at Morte Point in North Devon the butterfly occurs on a rocky peninsula which is covered with heather and dry grass with some bracken and bramble on the sheltered side. There are no woods for several miles. In parts of Somerset and Hampshire it has been seen commonly in gardens and open places well away from woodland and there are also records from open chalk-down and heath. Some correspondents inform me that the butterfly has been in these types of habitat for many years and that there has been no recent spread into such areas. Although most records of *aegeria* in open country are from the western part of its range, there have recently been some reports of an apparent spread into new habitats which might be connected with the expansion of range. This might be explained by the greater number of butterflies now present in the recently colonized areas in the east which would also increase their chance of being seen in habitats other than woodland. My own observations in

Berkshire suggest that some butterflies tend to move into open country during dry spells and late in the season. This is well known among many other species of lepidoptera.

This species does not normally visit flowers so it is unlikely that butterflies move into new areas for this reason as perhaps do other species. Turner (*J. Soc. Brit. Ent.*, 3: 210-211) has, however, given many records of *aegeria* at flowers, but it was not always certain whether the butterflies actually fed from them.

In conclusion I would like to express my thanks to those who have already contributed information on the habitats of this butterfly, and in doing so would like to ask for further information, particularly regarding the present northward limits of the species in England and its status and habitats in the west of Scotland.

Records of Some Species of *Hydraecia* and *Procus*

By R. F. BRETHERTON, C.B., M.A.

I have recently been checking the identification of a number of specimens in my collection of the *Hydraecia* and *Procus* groups, making dissections and microscope examinations where this seemed necessary. There are no startling discoveries, but as confirmed records of these species are few and we still know little about their distribution and relative abundance, it may be well to set out the results.

Hydraecia oculea L. (*nictitans* Bork.).

N.W. Berks: Appleton, eight 6.viii.34; Tubney, four 30.viii.39 and 7.ix.41; Cumnor Hill, one 10.ix.31.

Dorset: West Lulworth, Povington and West Holme Heaths, four 15/22.viii.39.

Surrey: Ottershaw, 4/13.viii.46, three.

Westmorland: Witherslack, five, various years 17/28.viii; Kent Bank, two, 1.ix.36, 7.ix.40.

Lancashire: Grange-over-Sands, six, various years 13.viii/12.ix. St. Anne's-on-Sea, one 15.viii.08.

H. crinanensis Burr.

Cumberland: Carlisle District, two, 20.viii.21, viii.20 (E. B. Ford).

Westmorland: Caldron Snout, one 7.ix.35 (caught flying in mid-day sun). Shap, two vii.34 (J. L. Messenger).

H. paludis Tutt.

Kent: Sheppey, vii.05, one.

Lancashire: St. Anne's-on-Sea, one vii.14; Southport, one vii.12.

H. lucens Freyer.

No certain examples; but some years ago Dr. E. B. Ford, after superficial examination of the genitalia, identified as this species two caught at Tubney (N.W. Berks.) on 6.viii.31. On dissection, I found that the genitalia of one had become damaged beyond recognition. Those of the other are not *H. oculea*; but neither do they agree closely with those of *H. lucens*, nor yet with those of *H. paludis*, which are very

like it. The moths are notably larger and have a duller and more uniform ground colour than any of my many *H. oculea* from the same area.

As regards *H. oculea*, in nearly all my examples the reniform stigma (the "ear" mark) is white; but in one from Kent Bank and one from Witherslack it is pale yellow. I have heard it said that *H. oculea* never has a yellow reniform; but this seems to be incorrect. Of my *H. crinanensis* the three recorded above all have the reniform golden, but in two others, which are without data, it is white. Of the *H. paludis*, in the one from Sheppey it is pale yellow and in the two from Lancashire it is white. In the doubtful *H. lucens* it is white. In wing expanse all my *H. crinanensis* are rather large, considerably exceeding the average of *H. oculea* and equalling that of *H. paludis*.

Procus strigilis Clerck.

Isle of Wight: Brook, two 20.vi.31.

Surrey: Ottershaw, twelve (earliest, 24.v.52, latest 25.vi.50). Byfleet, one 21.vi.47.

N.W. Berks.: Tubney, one 11.vi.44.

Oxon.: Hell Coppice, two, 12.vi.33.

Cambs.: Wicken Fen, three, 17.vi.45.

Inverness: Aviemore, two very large and coal black, 1.vii.47.

P. versicolor Bork.

Surrey: Ottershaw, four, 9 and 13.vi.47, 10.vi.52.

P. latruncula Schiff.

Surrey: Oxshott, one 1.vii.33; Ottershaw, ten (earliest 31.v.52, latest 25.vi.50).

N.W. Berks.: Bagley Wood, one 4.vi.35; Cothill, two 26.vi.30, 14.vi.43; Cumnor, one 12.vi.41.

Oxon.: Hell Coppice, three 12.vi.33; Waterperry, one 23.v.43.

Cambs.: Wicken Fen, three 17.vi.45.

Middlesex: Ruislip, one 2.vii.27.

Since these specimens were a random selection (except perhaps as regards condition), the small numbers of *P. versicolor* indicate that it probably is much rarer and more local than the other two species. In time of appearance there seems to be an almost complete overlap: all three were taken in good condition at Ottershaw on the nights of 13th June 1947 and 10th June 1952. But on the run of dates, *P. strigilis* seems to appear first, *P. latruncula* a few days later, and *P. versicolor* last, though the numbers are too small to warrant certainty about this. Superficially, there is great variation in all three species. *P. latruncula* is, on the average, markedly smaller than the others, and has a very high proportion of unicolorous black or very dark specimens: indeed only two out of two dozen of mine have any appreciable white on the forewings. The very strongly marbled forms seem to occur only in *P. strigilis*, which has, however, also up to one-third of black or very dark examples. Two of my *P. versicolor* are wholly dark, and in the other two the white markings are only moderately developed: but all four have a curious reddish sheen, which is not exactly reproduced in any examples of the other species.

The remaining three species of the genus *Procus* present little difficulty in identification, and their distribution is pretty well recorded already. It is, however, perhaps worth noticing that all six species occur in my garden at Ottershaw: *P. fasciuncula* Haw., usually likes wetter places, and is rather rare here, in late June and July. *P. furuncula* Schiff. (*bicoloria* Vill.) is abundant and infinitely variable in late July and August. *P. literosa* Haw., which is mainly a coastal species, was noticed in my light-trap for the first time between 23rd July and 11th August 1952 (seven specimens): it has also been taken in small numbers at New Haw and Walton-on-Thames.

[Mr. Austin Richardson's records of *Hydraecia* species were printed in this journal in 1951 (*Ent. Rec.*, 63: 304), five of them being new county records. *H. paludis* is widespread but uncommon in inland localities. Mr. Richardson found it at Nailsworth, Gloucestershire, while Dr. K. C. Greenwood notes (*Ent. Rec.*, 63: 279) that in 1951 *H. paludis* "was much more plentiful than last year at Southport, and a varied series of the fine local form was secured". More recently (*Ent. Rec.*, 65: 46) Commander G. W. Harper has reported *H. oculatea*, *H. paludis*, *H. lucens* and *H. crinanensis* at Newtonmore, Inverness-shire.—Ed.]

A Note on *Spatalistis bifasciana* Hüb.

By H. C. HUGGINS, F.R.E.S.

Mr. Allan recently sent me the following Note by J. B. Hodgkinson from the *Entomologist*, 28: 55, and asked me to comment upon it:—

"*Chrosis bifasciana* = *audouinana*.—This pretty species seems to be of rare occurrence of late years, at any rate I could only muster three specimens in thirty years, until Burney's sale in January last, when I purchased about thirty-eight specimens, part in the collection and others in duplicate boxes. All of them had evidently been taken at the beginning of the 'gilt pin' era, some thirty years ago; the pins were tarnished, and most of the specimens were a little greasy and 'verdigrised' about the head and body. Does any one know what the larva feeds on? Stainton says "amongst oaks".—J. B. HODGKINSON, Ashton-on-Ribble. December 1894. [This species is said to be not uncommon at Chattenden in Kent.—Ed.]"

Almost everything connected with this unusual Tortrix seems to present a certain amount of difficulty. Even its name is apt to cause confusion, as in conversation unless the generic name be used *Spatalistis bifasciana* Hüb. (1787) = *audouinana* Duponchel (1834) is apt to be muddled with *Argyroploce bifasciana* Haw. and so I usually refer to it when discussing it with friends as "*audouinana*". Its position in the Tortrices has also been a matter of controversy, but to-day, principally because of the raised scaling on the fore-wings, it is usually located in the Peroneinae.

The habits of the perfect insect are somewhat obscure. I have, however, in all netted nearly forty specimens, most of which have been in poor condition, and a few words concerning these may be of interest.

I never saw it at Chattenden, but the first specimen I noticed, in June 1923, was captured at late dusk in the now destroyed Wardwell Wood near Sittingbourne. I was netting *Argyroploce branderiana* Linn., which was flying wildly and rather high over a mixed growth of

aspen and oaks, and on catching one at a height of about ten feet found I had also taken a *bifasciana*. I have since taken several in the evening flying naturally and they have always been at least nine feet from the ground, usually round young oaks, and Mr. J. W. Corder also took one at a similar height when collecting with me. One cause, therefore, of the comparative rarity of the moth in collections would appear to be its high flight in not too good a light when scores of common little dark insects like *conwayana* are on the wing.

I have, however, beaten far more at mid-day or in the early afternoon. *S. bifasciana* likes to sun itself, normally at a good height from the ground, on a broad leaf, usually in my experience that of an oak, and on being dislodged flies rather sharply towards the ground. The late William Fassnidge and myself netted a fair number in this way in a wood near Southampton and also in one of the rides near Stubby Copse in the New Forest. In those days my eyesight was exceedingly good and I could usually identify it on the wing as it glinted with yellow, the only insect I occasionally confused with it being *Pammene germerana* Hüb., also a small dark moth with yellow spangles.

With one exception I have never seen *bifasciana* beaten from any tree but oak; Fassnidge netted one when with me from *Rhamnus frangula*.

The food-plant so far as I know is still a matter of doubt. There are a number of references to it in various books, but I have never seen any definite account of its being reared, or its feeding habits. Barrett, vol. x, p. 200, says the food-plant appears to be oak and that on one occasion it was reared from a gall of *Cynips lignicola* gathered from oak bushes. This, however, is not conclusive, and I am bound to say that although I have collected what must amount to several buckets of oak-galls in my time *bifasciana* has not appeared.

Meyrick says: "Larva in berries of *Rhamnus catharticus* and *Cornus* (perhaps also of holly)" and Lhomme (*Cat. des Lép. de France et de Belgique*, II, No. 2388) says that in France the food-plants are *Vaccinium myrtillus*, *V. uliginosum*, *Rhamnus catharticus* and *Cornus mas*. My friend Mr. L. T. Ford in his *Guide to the Smaller Lepidoptera*, p. 57, No. 326, gives "Larva in berries of *Rhamnus catharticus*, *Cornus*, perhaps also holly and privet" but in answer to my enquiry he informed me that he had never bred it and knew no account of its being bred but that he had beaten 14 from privet in a wood where there was no *Rhamnus* and only a little *Cornus* nowhere near the privet, hence the addition in his book.

As, therefore, so far as can be judged, all these suggestions of *Cornus*, *Rhamnus*, etc., are pure guesswork, oak appears to be the best bet. I have never heard of the moth's being taken anywhere where oak did not occur or far from oak. I have never seen it where *Vaccinium* of any kind or *R. catharticus* grew and several of my specimens were taken where none of the alternative plants grew either. With the one exception of a single insect beaten from *Rhamnus frangula* the whole of the fairly numerous captures I have seen have been beaten from or flying over oaks.

Fassnidge used to think it fed on *Rhamnus*, but this was chiefly because he believed in Meyrick and it became almost an obsession with him. When he took the one insect I have mentioned from a *frangula*

bush he was quite triumphant although we beat five others from oak the same afternoon and the *Rhamnus* bush was between two oaks. Moreover, Meyrick gives *catharticus* not *frangula*.

Near Gravesend I netted one in a wood of oak, birch, and willow, yet a mile away there was a remarkable copse, formed almost entirely of *Rhamnus catharticus*, *Euonymus*, *Cornus sanguinea* and privet, where I never saw a trace of *bifasciana*, though *Rhamnus* feeders like *derasana* and *sodaliana* abounded.

The conclusions I have come to are that *bifasciana* probably feeds on oak, that there has been a good deal of guesswork in the current accounts of its life-history, and that it is time someone gave a circumstantial account of breeding it. The late W. G. Sheldon always hoped to do so, but when we last discussed the moth about 1930 he had never succeeded in taking one.

The moth is pretty generally distributed on heavy clay in the southern counties. I have seen it at Sittingbourne, Barham, Blean, Gravesend, and Ham Street in Kent, near Southampton, and in several parts of the New Forest, so that to a young man with good eyes the problem should not be insoluble.

Collecting Lepidoptera Abroad

By D. G. SEVASTOPULO, F.R.E.S.

To English collectors visiting Continental localities, where the volume of captures is far in excess of what is normally taken in England, a description of the equipment used by a collector in the Tropics may prove helpful.

The usual English technique of pill-boxes is not suitable as, apart from the usually larger size of the insects encountered, it is impossible to accommodate the catch on a good day in this manner.

My equipment is simple and, to my mind, practical. Two killing-bottles that will fit into the side pockets of shorts or trousers (I use screw-topped pound size jam jars), two or more cigarette tins of the 'flat fifty' type containing transparent envelopes of the kind used by stamp-collectors, and a pair of forceps are what I carry in my pockets. In addition I carry a satchel, a B.O.A.C. overnight zip-bag is very suitable, containing tins for larvae, a large tin to contain food-plants not available near home, a spare net bag, scissors, a magnifying glass in a special box, and a tightly corked bottle containing nicotine poison with a needle inserted eye-end outwards inside the cork.

Small insects are killed in the killing-bottles, care being taken to reverse the wings of any individuals that die 'inside out' as soon as they are motionless. Larger insects, or slow dying ones like the species of *Acraea* and *Zygaenids*, are killed by a prick with the nicotined needle, the small drop contained in the eye usually being sufficient to ensure immediate death. These nicotine-killed insects are placed at once in the transparent envelopes in the cigarette tins. The insects killed in the killing-bottles are left therein for twenty minutes or so before being transferred to the envelopes. I find the easiest way of doing this is to use each bottle for about fifteen minutes in turn.

It is surprising what a large volume of captures can be brought home in first class condition by this method.

What is done with the captures once they are safely home must be left to the individual collector. I personally would paper everything in order to avoid the necessity of carrying bulky luggage to accommodate setting-boards and store-boxes, not to mention the risk of damaging pinned insects during travelling; but then papering has never been popular with English collectors. Kampala, 7.ii.53.

Macrolepidoptera in North East Derbyshire: A Record for 1952

By J. H. JOHNSON.

(Continued from page 110)

Cirrhia icteritia Hufn. (5). August 12th. August 30th. At sugar and light. 2 were var. *flavescens*.

Conistra vaccinii L. (18). April 7th. October 26th. Taken at light, sugar and ivy blossom.

Conistra ligula Esp. (7). October 26th. All at ivy bloom.

Cryphia perla Schf. (44). June 16th. August 5th. This species was far more abundant than usual. 25 were taken in the garden light trap, the others were found at rest on walls. One larva was seen on March 9th feeding on green algae growing on a brick wall. Damp seasons favour the growth of this plant, so there may be some correlation between wet years and the abundance of *C. perla*. None found on moors.

Apatele megacephala Schf. One larva on black poplar at Ashover.

Apatele psi L. (3). June 25th. July 7th. Several larvae on hawthorn, buckthorn, and birch.

Apatele menyanthidis View. (6). May 25th. These were found on walls on Beeley Moors.

Apatele rumicis L. (5). May 17th. August 31st. 10 larvae were found in September at rest on the undersides of thistle leaves in Hepthorne Lane.

Amphipyra tragopoginis Cl. (12). August 7th. October 5th.

Mormo maura L. (2). August 5th. Taken at sugar near Stubbin Pond. This species is confined to a stretch of wooded country between moors and industrial area. Not more than 5 are taken any year.

Apamea lithoxylea Schf. (1) August 7th. The scarcity of this species is hardly credible. In 1935 it was as abundant as *pronuba*. Has the destruction of pastures affected it so soon?

Apamea monoglypha Hufn. (116). July 7th. August 18th. Still as common as ever at sugar, and still as variable; sooty varieties are common.

Apamea sordens Hufn. (1). July 13th.

Apamea secalis L. (138). July 20th. August 31st. Abundant at sugar, rare at light, extremely variable.

Procus strigilis Cl. (4). August 7th.

Procus fasciuncula Haw. (17). July 27th. August 14th.

Luperina testacea Schf. (249). August 2nd. September 24th. All taken at light trap in garden, very slight variation except in size.

Euplexia lucipara L. (1). June 25th. Usually very common.

Phlogophora meticulosa L. (1). October 12th. This species is never

common, usually one or more specimens are found at rest on walls or trees. One larva was found on rose in April. Larvae were obtained from eggs deposited by the female taken on October 12th; they refused to eat anything but chickweed.

Petilampa minima Haw. (4). July 17th. August 7th.

Hydraecia oculea L. (7). August 8th. September 4th. Usually abundant on Darley Moors, but none seen this year. All these specimens were taken at sugar in Tupton Woods.

Hydraecia micacea Esp. (11). August 18th. September 3rd. Larvae feeding on potato haulms.

Gortyna flavago Schf. (1). October 17th. Taken at a street lamp near Clay Cross Station. One larva was taken in a mugwort stem.

Cosmia trapezina L. (2). August 8th. August 29th. Taken at sugar. Usually far more abundant in Tupton Woods in other years.

Arenostola pygmina Haw. (5). August 12th. October 4th. These were taken on Beeley and Darley Moors in flight during the day.

Nonagria typhae Haw. Larvae found in stems of *Typha latifolia* growing at Old Tupton.

Panemeria tenebrata Scop. (12). May 24th. Found among food-plant at Alton and on No. 4 Tip, near Hepthorne Lane.

Bena fagana Fab. Larvae beaten from birch in Hardwick Wood.

Euclidimera mi Cl. (5). May 18th. May 24th. Found on old pit tips.

Polychrisia moneta Fab. (1). July 22nd. Taken in the garden laying eggs on monkshood.

Plusia chrysis L. (11). July 1st. August 1st.

Plusia gamma L. (4). May 24th. August 14th.

Plusia interrogationis L. (2). August 21st. August 23rd. This species occurs on Beeley and Darley Moors usually in abundance.

Hypena proboscidalis L. (36). July 9th. August 12th. Abundant in every nettle bed in July.

Alsophila aescularia Schf. (15). March 9th. April 18th. Common at street lamps near Tupton Woods.

Odezia atrata L. (6). June 12th. These were found in a rough pasture near Heath School. Many of the localities where this species was formerly abundant have been ploughed up, consequently the food-plant has disappeared.

Sterrhia aversata L. (10). July 8th. August 7th. These were taken in the garden light trap. Two of them had the forewings with a thick dark brown band.

Xanthorhoe spadicearia Schf. (6). May 16th. May 19th.

Xanthorhoe montanata Schf. (3). May 23rd. May 31st. Usually this species is very common in all the woods in the district, where it is found in May resting on the herbage. This year it was uncommon.

Xanthorhoe fluctuata L. (36). April 25th. September 7th. This moth seems especially addicted to industrial areas. The larvae seem to thrive best on sooty wallflowers.

Ortholitha chenopodiata L. (myriads). July 6th. August 17th.

Colostygia didymata L. (35). August 10th. August 30th. This moth is found on one part of Darley Moors in some numbers. It is easily seen resting on the stone walls, but is not easily captured; as soon as one gets close to it, up into the air it darts.

Colostygia multistrigata Haw. (7). April 10th. April 25th. Taken at street lamps near Tupton Woods.

Earophila badiata Schf. (11). April 7th. April 25th. This species is found wherever there are rose bushes.

Euphyia bilineata L. (26). July 4th. August 29th. This is another "industrial" species. Light seems to have little attraction for the imagines, but they are easily found resting on foliage.

Electrophaes corylata Thun. 8 larvae beaten from birch bushes in Hardwick Wood.

Pelurga comitata L. (3). August 21st.

Ecliptopera silaceata Schf. (1). August 5th. I am surprised that this species is not more abundant since its foodplant is so plentiful in the area. This is the first imago I have ever taken.

Lygris populata L. (73). August 21st. August 31st. Very common on Beeley Moors, but occasionally appears in Hardwick Wood.

Lygris mellinata Fab. (1). August 1st. Usually abundant.

Cidaria fulvata Forst. (12). July 14th. July 27th. A few were beaten out of rose bushes in Tupton Wood and also in Langwith Wood.

Dysstroma citrata L. (1). August 8th.

Hydriomena furcata Thun. (75). August 18th. August 26th. Large dark green forms were plentiful on Beeley Moors.

Anaitis plagiata L. (1). August 8th. St. John's-wort is uncommon, so this species is not expected to flourish here.

Epirrhoe tristata (L.). (25). June 15th. Found at rest on walls on Darley Moors. Another easily disturbed species.

Epirrhoe alternata Müll. (2). August 3rd. August 8th. *Galium* spp. are uncommon in the area.

Eupithecia linariata Schf. (6). July 1st. July 25th. Larvae abundant on Yellow Toadflax.

Eupithecia centaureata Schf. (1). July 10th.

Eupithecia absinthiata Cl. (3). July 4th. The bright yellow larvae were quite common on wormwood in September. While searching for *C. absinthii*, I found 25 of this species.

Eupithecia vulgata Haw. (4). May 17th. August 4th.

Eupithecia icterata Vill. (4). July 22nd. August 13th.

Operophtera brumata L. (155). November 3rd. December 23rd. By searching tree trunks in Tupton Park after dark I was able to find dozens of pairs *in cop.*, but they were by no means as numerous as they were last year.

(To be continued)

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Dioryctria banksiella Richardson. The larva of this very local moth may be found in its chosen localities on the limestone cliffs of Dorset at the end of May, feeding on *Inula crithmoides*. Its galleries, which are silken and external, are easy enough to find and may be spun on any portion of the plant from flower-shoot to base. In my experience this moth only occurs in the more or less precipitous places; where its food-plant grows on the flat it is absent, as *Agdistis staticis* Mill. is on the low-growing *Statice* in the same district. It is as well to breed this

insect as although it may be netted easily enough at dusk in July by a little judicious cliff-climbing, and it usually seems to be in good condition, caught specimens are usually males. In 1936 of a score caught only two were females, which, however, made up 50% of those bred by me in 1937.

Platyptilia tesseradactyla Linn. The first fortnight in June is as good a time as any to look for *tesseradactyla* in the north-west and west of Ireland. I should not despair of finding it anywhere in those parts where its food-plant, *Antennaria dioica*, grows, as not only is it found all over the Burren but it is also on sand eskers and metamorphic rock in Tyrone and Donegal.

P. tesseradactyla does not like moving in wet or very windy weather and at the time of the year it flies it is usually one or the other, or both, in its chosen localities. I stayed for a week at Ballyvaughan some forty years ago and had one decent half-hour for collecting, during which I caught one *tesseradactyla* on the Blackhead Road, whilst my friend, J. W. Corder, who stayed there for a month a few years before, had one fine day and captured a nice short series then, seeing no others the whole time. Luckily the moth is fairly common where it occurs and sticks pretty tightly to the food-plant, so it is easy enough to get with the bee-smoker.

In 1938 I stayed with the late Thomas Greer at Dungannon and visited several localities for the plume. The whole week it blew incessantly and usually rained, and for two days we got nothing. The third day I unpacked the bee-smoker and we visited a place with several good patches of *Antennaria*. Greer had rather a pitying look in his eye when I began to puff the smoke, but soon changed it when I fetched up about 30 in an hour, bringing home 2 dozen perfect ones. The only trouble with the smoker is to avoid burning the hands when using it and a net at the same time; it is best to get a friend to work it who can concentrate on what he is doing, and if he is careless and gets blistered the net-man can observe a philosophic calm and express sympathy.

Laspeyresia leplastriana Curt. The larva of this Tortrix may be found commonly in stems of wild cabbage on the Kent and Sussex cliffs in late May. Its presence is easily detected by frass at the axils of the leaves or base of young shoots. All that is necessary to rear it is to take the stems home and heel them into the ground till the end of June when they can be put into a breeding-cage, as the larva pupates in its burrow. The moth is common where it occurs at all. I have bred a dozen or more from one stem. It may also be netted flying in the sun over the cabbages in July.

Current Notes

We hear that the Cotteswold Naturalists' Field Club "hopes to acquire sufficient information about the insects of the county" (Gloucestershire) "to be able to produce reasonably representative lists of the local fauna. At present we can feel satisfied only over the lists of Macro- and Micro-lepidoptera". Anybody who can "feel satisfied" over published county lists of Lepidoptera must be very easily pleased, for we have yet to meet with a county list which is even remotely accurate.

The latest of these compilations, recently sent to us for review, contains so many mistakes of almost every conceivable description that we thought it kinder to ignore it in these pages. The names or initials (sometimes both) of persons were mis-spelt 44 times; mis-spellings of generic and specific names numbered 50; five references were inaccurate; and the total number of mistakes which we noted amounted to 259 (or 309 if the wrong initials of the recorders are counted). Several species which could not conceivably occur in the county were included, followed by such comments as "I can find no record of this insect", "No reliable record", "No known record for the county" (three species), and so on.

Judging by the county lists already published the aim of their compilers has been to include as many species as possible. Therefore if Miss Smith-Smith "thought she saw a Purple Emperor in her garden" in some town north of Lincolnshire "because it was exactly like the picture of a Purple Emperor in Coleman's *British Butterflies*", down it goes as a county 'record' of *Apatura iris* L. The county list for Hampshire includes a 'record' of *Leucodonta bicoloria* Schiff. "Hayling, larvae found on maple and 2 imagines bred". Suchlike extravagances abound in these county lists. We have even seen an inland county list which contains several maritime species recorded by a lad of a somewhat eccentric nature (known to us personally) who sent his preposterous list of "personal captures" to the editor as a "joke". What is the use of these inaccurate lists? How can a list of fauna which contains doubts and errors and fabulous species be of any value whatever to a science?

It would seem to be impossible for a committee to produce an accurate list of county Lepidoptera. The reason for this is plain. The lists are produced by societies and the members are asked to submit their lists of captures to one of the members who has been appointed editor. The members range from schoolboys and young school-teachers to experienced lepidopterists. The editor knows that he will give grave offence if he refuses to include certain insects which some of his fellow-members aver that they have seen "without any doubt" or of which they produce for inspection specimens with erroneous data labels or perhaps without any labels at all. Perhaps the editor refers the matter to the President, who is not a lepidopterist and being a kindly man says "It doesn't really matter, does it? Put it in. It's not worth while offending Blank—he's a good fellow and we don't want to lose him".

So the only "county" list which the zoologist can use for scientific work is the list compiled by an individual whose work is known to be invariably accurate, therefore reliable. The county lists compiled by societies—of which we have just mentioned a recent example—are pleasant and interesting reading (provided they do not contain too many misprints) and perhaps they add a certain kudos to the society; but to the man of science they are useful only as indicating the range and distribution of the more common species—information which he can usually obtain from back numbers of the magazines. The 'standard' text-books on the British Lepidoptera contain only too many examples of the way in which these "county" lists have misled.

Apropos of our Note on the embellishing (!) of the English countryside with exotic conifers, printed at pages 84-85 of our March issue, we quote the following from a letter recently received. "What do you think of this?—Forty acres of the best part of Wyre Forest have been fenced for use as a testing ground for guided missile projectors—and this on the spot where *Endromis versicolora* still holds out and roe deer still survive. I will not comment, as it would be improper to express my feelings in writing." We have called the attention of the Committee for the Protection of British Insects to this outrage.

Practical Hints

Cabinet specimens of *Geometra papilionaria* L. do not retain their original greenness for very long; so one is obliged to renew one's series every decade, if not sooner. Now is the time to collect the larvae for this purpose. It is a common and widely distributed insect, occurring throughout the British Isles wherever there is birch in plenty, as far north at least as Lat. 57° N. We have found the larva on hazel and alder as well as on birch, and Allan (*Larval Foodplants*) gives beech and broom as additional foodplants. The pictures of the larva in the usual textbooks are not altogether satisfactory, as regards colour at all events. The green in Buckler's picture is too pale; in Barrett's the green is more or less the right tint, but somehow it is not very convincing. South's figure is not coloured and the larva is too stumpy.

Searching for this larva is pleasant work. Usually, in fact almost always, it rests by day near the extremity of a twig, on the southern half-circle of a bush, and usually at a height convenient for the lepidopterist. But when full-grown it ascends higher and we have seen it near the top of a birch bush nine feet high. Quite often it holds the stalk of a catkin with its claspers and, hanging head downwards, thus simulates a double catkin. So whenever you see a double catkin suspect one-half of it. The larva holds on tightly, so you must take a pair of folding pocket scissors with you when you go *papilionaria* hunting.

Few moths are so anxious to lay eggs in captivity as a female *G. papilionaria*. We have had them lay in a match-box and in a glass jam-pot. Eggs so laid are invariably fertile; but rearing the species from egg to moth is another matter altogether; for the larvae gnaw the bark of their twigs during the winter, therefore they must be kept on a growing branch. In other words you can rear them quite easily if sleeved on a birch bush but not at all in a larva cage. In the spring we often find them by looking, not for the larvae, which are so extremely like the shapeless opening buds of birch leaves that one sometimes squashes them unawares, but for the little white rings on twigs where they have nibbled the bark. Provide moss and dead leaves for cocooning.

If you live in a town where many gardens are bounded by tall privet hedges it may be worth your while, before the end of this month, to prospect these hedges with a torch by night. The larvae of *Apeira syringaria* have a habit when not feeding of lowering themselves from a leaf by a silken thread and rotating gently at the end of this thread, just like a spider. Why they do this nobody knows. It may be an aid to digestion. Or it may be merely *joie de vivre*.

Now is the time to collect the larva of *Philereme vetulata*. It feeds only on *Rhamnus catharticus*, and spinning leaves on a shoot together is not difficult to find. When full grown it seems to move inwards towards the middle of the bush; but spun-together leaves will usually indicate its presence. This moth occurs in the Fens as well as on the chalk in the southern half of England, also sporadically as far north as Westmorland. Probably to be found in most districts where *Rhamnus catharticus* grows freely.

Don't forget to beat the flowers on the lowest spreading boughs of big maple trees during the last ten days of May for larvae of *Eupithecia inturbata*. After the first one or two have fallen into the beating-tray examine them closely and then see how many you can find by searching. They resemble the blossoms in colour to the *n*th degree. They eat only the blossom, are easy to rear, and pupate in dry peat.

Notes and Observations

EARLY BUTTERFLIES.—I was surprised to see two specimens of *Aglais urticae* L. on coltsfoot flowers on 7th March about noon near Heath School. I saw another specimen resting on grass on 16th March. Although it was undamaged it was apparently too weak to fly. The sun was shining and it was fairly warm, and the butterfly was enjoying the warmth. Minimum temperature during the night was about 25° F. Perhaps the low temperature had something to do with the insect's weakness. I took the butterfly indoors and released it later when it had recovered the use of its wings.—J. H. JOHNSON, 53 Knighton Street, Hepthorpe Lane, Chesterfield. 17.iii.53.

EARLY SCOTTISH MOTHS.—Very mild weather all this year so far has resulted in the following very early emergence records. *Phigalia pedaria* Fab. on 15th January; *Colostygia multistrigaria* Haw. on 26th February; *Achlya flavicornis* L. and *Orthosia incerta* Hufn. on 28th February; *O. gothica* L. on 1st March; *Lycia hirtaria* Cl. on 10th March; *Brachionycha nubeculosa* Esp. on 12th March; *Cerastis rubricosa* Schiff. on 14th March; *Poecilopsis lapponaria* Bdv. on 14th March, and ♀♀ are appearing on the day of writing. These dates are, I think, at least three weeks earlier than usual.—G. W. HARPER, Nedaich, Newtonmore, Inverness-shire. 17.iii.53.

SPRING LEPIDOPTERA IN HAMPSHIRE.—Pressure of work has prevented me from doing much field work so far this year, although I have been working a m.v. lamp in my garden. The first specimen seen this year was *Conistra vaccinii* L. which appeared at a bedroom light on 19th February. On 25th of the same month I saw *Aglais urticae* L. in the garden and in the evening a specimen of *Erannis marginaria* Fab. fluttered at a lighted window. *Gonepteryx rhamni* L. was seen for the first time on 27th February. *Orthosia gothica* L. and *O. stabilis* Schf. came to the m.v. lamp on 7th March and *Xylocampa areola* Esp. was out by 25th March. *Archiearis parthenias* L. was seen in the birch woods in some numbers on 15th March when the weather was warm and sunny, two days later the first *Nymphalis io* L. was seen. The first *Orthosia cruda* Schf. was not noted until 22nd March.

On Good Friday evening a specimen of *Diurnea fagella* Fabr. came to a room light and the following day I made my first full scale excursion when I took the m.v. lamp to the pine wood on the outskirts of the New Forest where last year at an earlier date I had taken *Plusia ni* Hb. This year the only species noted were the common *Orthosia* already referred to plus *O. incerta* Hufn. and a singleton of *Colostygia multistrigaria* Haw. in rather rubbed condition.—A. C. R. REDGRAVE, Hartsdown, Glenfield Ave., Bitterne, Southampton. 9.iv.53.

SCARCITY OF SPRING MOTHS.—This has been a cold spring, and with the exception of one or two days, field work has not been very productive. About a month ago I went to try and find *Apocheima hispidaria* for a friend. We called at two of my old haunts which have not been cut about or otherwise spoilt, but only one specimen was found, a fat ♀. The usual spring moths are few and far between, one *A. flavicornis* being the only other insect taken.—G. B. MANLY, 72 Tenbury Road, Birmingham, 14. 6.iv.53.

EARLY BUTTERFLIES IN THE ISLE OF PURBECK.—From the beginning of February until now in the sheltered parts of the Island away from the sea many *Vanessa atalanta*, *Aglaia urticae*, and *Nymphalis io* have been on the wing, and on two or three very warm days in March they were observed near the sea. The first *Gonepteryx rhamni* appeared in Coombe Woods on 27th February. Early in April *Celustrina argiolus* was noticed on the outskirts of a copse, *Lycaena phlaeas* on the railway embankment, and flying at Swanage near the sea on 2nd April a *Pieris rapae*.—LEONARD TATCHELL, Swanage. 13.iv.53.

A NOTE FROM SOUTH DEVON.—My light trap was in operation for only a few nights in mid-March (11th to 19th), when it gathered in visitors to the sallow catkins in a nearby hedge. They were chiefly *Orthosia stabilis*, with a sprinkling of *O. gothica*, *O. cruda*, and *Xylotropa areola*, a few hibernators—*Lithophane socia*, *Graptolitha orni-topus*, *Conistra vaccinii*—and single specimens only of *O. incerta* and *Cerastis rubricosa*. The Geometers were represented by the 'regulars', *Alsophila aescularia*, *Erannis marginaria*, *Selenia bilunaria*, *Biston strataria*, and a single *Colostygia multistrigaria*. Since then the nights have been very cold persistently and it has not been worth while going out or operating the trap.—FRANK H. LEES, The Gables, Maidencombe, Torquay. 14.iv.53.

EARLY APPEARANCE OF MACROGLOSSUM STELLATARUM L.—A specimen of *M. stellatarum* flew into the porch of my house at Maidencombe at 9.30 a.m. on 30th March. The weather was stormy, temperature 49° F., wind westerly. On 4th April another specimen was seen flying over 'pheasant's eye' Narcissus: it was not the same specimen seen on 30th March, being much smaller and browner in colour. It is not possible to say whether these insects had wintered here or were immigrants; but since there has been no sign yet of other migrants the former supposition seems the more likely.—FRANK H. LEES, The Gables, Maidencombe, Torquay. 14.iv.53.

SALLOWING IN 1953.—Once again sallowing has been extremely poor in my district. March was remarkable for a long period of drought with

many sunny days but cold nights. Night after night mist or fog formed in the valleys and often reached high up the hillsides. The sunny days, however, brought out the willow catkins, and the scattered trees and bushes in a neighbouring wood gave a wonderful display. A number of evening visits were made to the best groups of willows, but in vain were the trees and bushes shaken over a raincoat or sheets of paper. One moth per tree was about the average attendance. Not for many years have I had a really good night at willowing. In this part of the country the coincidence of the full bloom of the willow, a goodly emergence of moths, and a warm moist evening, is a rare event.—T. D. FEARNEHOUGH, 13 Salisbury Road, Dronfield, Derbyshire. 12.iv.53.

NOTES FROM EAST ESSEX.—Conditions during the past three weeks seem to have been rather unpropitious for light, it being either windy, or clear and cold. Owing to absence no observations were made between 12th February and 23rd March. One *V. urticae* and four *V. io* were seen on 25th March, *io* remaining the commoner of the two until about 7th April; since 10th April many more *V. urticae* have appeared and are now in a considerable majority. Of the spring moths *O. gothica* has been by far the commonest. Species so far recorded with first dates are as follows:—*A. ipsilon* 2.4, *C. rubricosa* 2.4, *O. gothica* 25.3, *O. miniosa* 8.4, *O. cruda* 24.3, *O. stabilis* 27.3, *O. incerta* 26.3, *O. gracilis* 12.4, *C. chamomillae* 13.4, *G. ornitopus* 5.4, *X. areola* 4.4, *E. transversa* 18.1, *C. vaccinii* 18.1, *C. ligula* 18.1, *P. meticulosa* 8.4, *A. aescularia* 29.1, *A. badiata* 1.4, *H. rupicaprararia* 13.1, *H. defoliaria* 23.1, *H. marginaria* 3.4, *P. pedaria* 23.1, *L. hirtaria* 3.4, *S. bilunaria* 12.4, *A. strataria* 24.3.—A. J. DEWICK, Curry Farm, Bradwell-on-Sea, Essex. 14.iv.53.

EARLY SPRING LEPIDOPTERA AT WESTON-SUPER-MARE.—The following are the first dates on which some of the usual common early spring Lepidoptera have been noticed by me at Weston-super-Mare up to the 8th March:—*Theria rupicaprararia* Schiff. 2nd January; *Phigalia pedaria* Fab. 10th January; *Alsophila aescularia* Schiff. 20th February; *Erannis marginaria* Fab. 21st February; *Orthosia stabilis* Schiff. 21st February; *O. gothica* L. 7th March; *Gymnoscelis pumilata* Hüb., *Xylocampa areola* Esp. 7th March; *Earophila badiata* 8th March. It may also be worth while mentioning that a female *Ectropis bistortata* Göze emerged in a breeding-cage in an unheated outhouse on 18th January. The pupa was dug by me from the base of an oak during the previous month.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 9.iii.53.

SPRING EMERGENCE OF *ERANNIS DEFOLIARIA* CLERCK.—A fresh specimen of this species came to light in my house on 16th March last. Barrett's only record of a March emergence is for 1895, but my diaries record specimens on 2nd March 1938, 16th March 1941, 21st March 1936, 2nd April 1939 and 3rd April 1937. It would appear therefore that early spring emergences of this species are not uncommon.—P. B. M. ALLAN, 4 Windhill, Bishop's Stortford, Herts. 17.iii.53.

A NOTE FROM SOUTH-WEST KENT.—The autumn scarcity of insects has continued throughout the winter hereabouts, and nights without exception have been cold. I have hardly ever been off my own premises and have been content with an ordinary electric light in my first floor

room facing north. My "strictly local" house and garden list has now reached 356 species, so expectations of good forms of common insects are perhaps justified but have not occurred.

My first *Erannis defoliaria* was on 10th November, but I only saw 2 more after that. Of *E. aurantiaria* and *Colotois pennaria*, the latter usually common here, I only saw one and two respectively. *Theria rupicaprararia* came first on 24th January, *E. marginaria* and *Alsophila aescularia* on 16th February, *Earophila badiata* on 12th March, *Orthosia stabilis* 6th March, *O. gothica* and *O. incerta* on 19th March. A hibernated *Chloroclysta miata* came, the first time to me, on 2nd April.

There was an unusual botanical appearance on Boxing Day when I found in my garden a single willow catkin open and showing yellow stamens.

Nymphalis io and *Aglais urticae* were first seen about the 6th of this month and *Anthocharis cardamines* was seen by a friend early this week. I am writing on 11th April.—G. V. BULL, Sandhurst, Kent. 11.iv.53.

ODONTOSIA CARMELITA ESPEY.—The observations on the above species by H. Symes in the December *Record*, (64: 337) make interesting reading. I have looked up my own few notes on the subject.

During the late war I knew of one larva that had been beaten at Ashted in Surrey, but this turned out to be parasitised. In the same area on the 1st July 1944 I was fortunate in finding three larvae; two were practically full fed and were taken from one of the lower branches of a large birch at some six to eight feet from the ground. The third was a small unhealthy looking individual taken rather low down and died without making further growth.

The identical locality provided me with another larva on the 21st June 1946 and in this instance it was found some twelve feet up at the top of a weedy sapling which I was able to examine by bending it down within reach.—W. J. FINNIGAN, 87 Wickham Avenue, Cheam, Surrey. 12.iv.53.

THE INTERIOR TREATMENT OF CABINETS.—The appearance of a good collection of insects is often impoverished by stained and discoloured paper and superfluous pin-holes in cabinet drawers, and periodically every collecting entomologist is faced with the tedious task of repapering. The following system has passed the experimental stage and proved most satisfactory:—

Prepare even quantities, measured by capacity, of oxide of zinc and ordinary milk, thoroughly mixing until a thin paste is formed. After scrupulous cleaning of drawers apply with a very soft brush (a large sized artist's brush is ideal) on top of the original paper. The drawers should be left open for twenty-four hours in a warm atmosphere, after which the camphor can be renewed if necessary, wads of liquid carbolic acid installed to prevent the formation of mould, and specimens replaced. Wads should be of cotton-wool tied tightly with cotton round the head of a pin and, after immersion in the liquid, not allowed to touch the surface of the drawer.

The result of this method of "painting" is the whitest background it is possible to achieve, all blemishes deleted and no trace of pin-holes whatever. Commencing with an empty 40-drawer cabinet the complete application can be carried out in under two hours as against many long,

monotonous hours of papering. The quantity of zinc oxide required for a cabinet of this size is approximately 8 ozs., costing about half-a-crown.

This treatment is also excellent for setting-boards, whether papered or otherwise; in fact, I much prefer smooth unpapered boards whitened in this manner.

One word of warning. The mixture must be used the same day as prepared for milk quickly becomes sour and if a stale preparation is employed the stench upon removal of lids is unbearable! When application and drying can be effected within the prescribed time, however, the result is quite odourless, harmless to specimens and pleasing in the extreme.

Finally, the wads of carbolic acid should be omitted from drawers containing the "Emeralds", to prevent discoloration.—PAUL H. HOLLOWAY, Eastleigh, Hants. 4.iv.53.

COLEOPHORA SYLVATICELLA WOOD IN NORTH DEVON.—On June 16th, 1951, I was in Clovelly, North Devon, and I found this *Coleophora* in plenty flying over plants of *Luzula sylvatica* in the afternoon sunshine. The plants were growing in masses in the oak woods on the cliff-sides above the village.—S. C. S. BROWN, 454 Christchurch Road, Boscombe, Bournemouth. 14.iv.53.

IS *SELENIA BILUNARIA* ESPER GETTING DARKER?—At one of the 'South London' meetings last year Dr. G. V. Bull remarked on the tendency towards melanism which had shown itself in *Selenia bilunaria* in his neighbourhood (Sandhurst, Kent). I do not think this was commented on by other members, but the same thing seems to be going on around Dorking, Surrey. In the Spring of 1951 a worn female laid me a few eggs before she died, and I was able to raise a third generation, some of which emerged in the late summer and the remainder in the Spring of 1952. This brood contained a number of very dusky individuals; male undersides varied to a dark chocolate colour, and females were nearly as dark. Two or three more dark specimens were taken in 1952, and two came to my lamp on 8th April this year. I have not worked this district long enough to know whether dark forms are on the increase, and it would be interesting to know if other collectors have noticed any significant change.—J. O. T. HOWARD, Wycherley, Deepdene Wood, Dorking. 12.iv.53.

LARVAE OF *LIMENITIS CAMILLA* L. AFFECTED BY PARASITES.—With regard to Mr. Hyde's note in the January issue (*Ent. Rec.*, 65: 24), during the past eighteen years I have frequently collected and reared the larvae of *L. camilla* in Sussex and Northamptonshire and have invariably lost a proportion through parasitism by a Braconid hymenopteron of gregarious habits. The proportion lost has become progressively greater since the summer of 1947, when *L. camilla* developed a partial second brood. The parasitised larvae died, usually, in their last instar when a cluster of small silken cocoons, similar to those which are found on dead larvae of *Pieris brassicae* L. (*Apanteles glomeratus* L.) appeared. Unfortunately it is now necessary to record a much more alarming parasite.

During the second half of April 1952 I collected about 50 larvae of *L. camilla* in Alice Holt and the Chiddingfold Woods. Most of these

had just entered the green stage. On 3rd May I found several of these larvae in a dying condition. Removing the dead bodies on 4th May I noticed what appeared to be a grain of wheat hanging below each larva by a silken thread about 3 inches long. This proved to be a cocoon containing a larva, and subsequently the pupa, of a solitary parasite which had killed its host. I sent specimens of these cocoons, and the flies which emerged from them, to Mr. W. H. T. Tams, who very kindly identified them for me as Braconids of the genus *Meteorus*. The species could not be decided, although it closely resembles one of a gregarious type. The British Museum collection does not appear to contain a similar insect of solitary habit and Mr. Tams was informed by Mr. Nixon of the Commonwealth Institute of Entomology that he would not expect a species to change from a gregarious to a solitary habit.

It is possible that *L. camilla* is now faced with a new predator which may affect its future status disastrously. From observations made this winter I have found a striking decrease everywhere in the number of hibernacula seen, in many cases finding none at all where in 1951 considerable numbers could be taken. Among those which I collected two-thirds were killed by this solitary parasite, while there were no losses from the former type of gregarious species. I should be interested to hear whether this particular type of infestation has been observed elsewhere.—A. E. COLLIER, Lynher, Cranleigh, Surrey. 4.iii.53.

A NEW FOODPLANT OF *NYSSIA ZONARIA* SCHIFF.—Things are beginning to liven up now but moths seem to be a little later than last year. I have had some *Selenia tetralunaria* Hufn. and *Drymonia ruficornis* Hufn. emerge at home, but have not met any in the wild so far. I have also had a few *Nyssia zonaria*; the third successive brood from a few ova given to me a year or so ago. These fed up very well each year on a cultivated form of Dyer's Greenweed, which I don't remember being given as a foodplant in any book. Mine were introduced to it by accident, an escaped larva being found on the plant in the garden and much larger than those on sallow in my cage. All grew much faster after the change of food.—W. E. MINNION, 40 Cannonbury Avenue, Pinner. 13.iv.53.

[This species is widely polyphagous, but Mr. Minnion's note is valuable as emphasising the beneficial effect, which a change of diet so often has on polyphagous larvae.—P.B.M.A.]

ON PHOTOGRAPHING LIVING INSECTS.—There is a considerable number of entomologists who take photographs of insects in all stages but one is usually aware of them only when their finished pictures are exhibited or published. There is no particular technical difficulty in the production of an insect photograph without elaborate apparatus, but a real problem exists in arranging the subject satisfactorily. For a successful picture the insect should be in its natural surroundings and in a natural attitude, two requirements which are often difficult to meet.

In the field, comparatively few insects can be readily photographed just as they are. Moths at rest on tree trunks or walls and other insects which rest in exposed positions by day can usually be dealt with fairly easily, but by far the greater number are either inaccessible, very mobile, at rest on vegetation which is continually moving in the wind, or in such positions that the lighting makes a good picture an impossi-

bility. Some of these problems can be solved on the spot by patience and ingenuity, but it seems inevitable that in very many instances it is necessary to take the insect home and deal with it under artificial conditions. The problem then is to provide surroundings that look natural, arrange suitable lighting, and then persuade the model to pose in the attitude and position required and remain still long enough to be photographed. Many flatly decline to co-operate, others become restive under artificial light and the warmth which often accompanies it, while the particularly irritating types delay all movement until the precise moment one makes the exposure.

Pictures have been published in which these difficulties have been overcome by the subjects being "etherised" or "temperature controlled", but the results of such methods are seldom convincing and the use of dead specimens, however carefully arranged, does not usually produce natural pictures.

In spite of the difficulties, which appear formidable to the beginner, many lovely pictures of insects are produced. Have the successful photographers any special dodges or devices to make their "sitters" behave? If so, would they please spare a few minutes to put into print any "tricks of the trade" learned by experience or experiment in order to help beginners to produce more and better pictures?

In this connection one might mention that gently blowing on a caterpillar will sometimes prevent it walking away at the crucial moment and that a m.v. light is a good substitute for photoflood lamps and gives quite good tone rendering in monochrome pictures.—W. E. MINNION, 40 Cannonbury Avenue, Pinner. 13.iv.53.

INCIDENCE OF *AMATHES C-NIGRUM* LINN. YEARS AGO.—In his interesting Note about Haworth in the March issue (*Ent. Rec.*, 65: 82) Mr. Allan refers to *Amathes c-nigrum* as "that lovely pest of the autumn sugarer" and attributes its rarity in the 18th and early 19th Century collections to the fact that in those days nobody searched the larval food-plants of the Agrotidae at night. But is it not equally probable that *Amathes c-nigrum* was actually a rare species in England in those days? Even without the use of sugar surely a species so abundant as *c-nigrum* is to-day would at least have been rated "frequent" in the 18th century had its incidence then been the same as it is now. Writing in the *Entomologist* of 1894 (27: 26) Claude Morley said: "In my diary I find the following note under September 7th: '*Noctua c-nigrum* is now going off. It has been a perfect pest, often four or five, sometimes more, round the light at a time. . . . They settle anywhere on the lamp, near the lamp, and on the ground, windows, or masonry.' . . . '*Noctua c-nigrum* has by no means been confined to electric light, having been taken at street-lamps, sugar, ivy, honeydew, among low plants, and, indeed, by every conceivable method by which and in which moths are taken . . .'"

Haworth and his contemporaries undoubtedly used light as a method of collecting moths, and it seems—to me at all events—impossible that Haworth could have described *c-nigrum* as "rare" if this word had not actually denoted the known incidence of the species in England at that time. Furthermore, in the same Note Morley remarks, "The prevalence of *Agrotis puta* this year is very remarkable. . . . I have taken it both at electric light and ivy in September." Yet, Mr. Allan tells us,

Haworth accounted this species to be of such great rarity that he knew of its existence in only five cabinets.

I suggest that these and many another Agrotid were actually rare in England 150 years ago. They are all what I call "garden moths", that is to say they flourish only in the vicinity of human habitations. It is the enormous increase of the human population of this island, accompanied by the equally vast increase in the area of land converted into gardens and market gardens, that accounts for the increase in the incidence of these species. Would *Polychrisia moneta* Fab. be such a common moth in England to-day if flower gardens were unfashionable and nobody grew Delphiniums?—AN OLD MOTH-HUNTER.

ANCYLOLOMIA TENTACULELLA HÜB.: A BELATED RECORD.—On 26th July 1935 at Dungeness I caught a Crambid which was flying about at dusk. It was unknown to me, as indeed were many other Crambids, and I kept it in the hope that one day somebody would tell me what it was. Not long ago I was moving some specimens when this particular one struck me as somehow familiar. It was in fact very like the insect described and illustrated by Canon Edwards and Mr. Wakely in their article in the *Record* last October. Dr. de Worms was good enough to take it to the British Museum, where it was identified by Mr. Martin as *A. tentaculella*. Thus luck sometimes favours the ignorant.—A. M. MORLEY, 9 Radnor Park West, Folkestone. 24.iii.53.

EREBIA AETHIOPS ESP. IN WORCESTERSHIRE.—On 27th July 1947 in Wyre Forest I netted what I thought were six *Maniola jurtina* L., but later found that an *Erebia aethiops* was included, a male in good condition. Presumably the larva or pupa had been carried in farm or garden produce from the North to this area, which is about 80 miles from the Lancashire locality, as it is even less likely that some local entomologist had been breeding the species and this was an escape. I showed the specimen to my friend Colonel Bowater, and we visited the spot in July 1950 and 1951, but saw no further specimen.—A. R. WARD, 196 Pretoria Road, Bordesley Green, Birmingham, 9.

THE NEW FOREST IN THE 'NINETIES.—In the January number of this magazine, p. 25, Mr. R. C. Dyson writes: "... The Victorian lepidopterists were indeed fortunate to have lived in a land of plenty". But the Victorians knew lean years also and, for aught we know, conditions in the New Forest a hundred years ago *may* have been as depressing—to the lepidopterist—as they are to-day. However, there is no doubt that the 'nineties were years of plenty and recently I came across the following description of a day's collecting in June 1893 in the Roe enclosures (about 3 miles N.E. of Ringwood):—

"I followed the bed of one of the streams in search of water to drink, and for the first time was disappointed in not finding sufficient to quench my thirst, not a pool being left; but I was well repaid by the sight I witnessed; the said bed of the stream *for more than a mile* was literally crowded with butterflies, the bulk being composed of *Argynnis adippe*, *A. paphia* var. *valesina*, and *Limenitis sibylla*, also *Argynnis aglaia*, *A. selene*, and *A. euphrosyne*, *Epinephile hyperanthes* and others in lesser numbers; they were mostly busy probing the sand and gravel in search of water; some were quietly resting with folded wings, others seeking

the shady nooks underneath the banks, but withal with a constant flutter of wings and restlessness Although I netted several good varieties in other parts of the Forest, I did not see anything but var. *valesina* worth taking upon this day and of which I took twenty-six specimens".—J. H. FOWLER in *Entomologist*, April 1894, vol. 27, p. 142).—P. B. M. A.

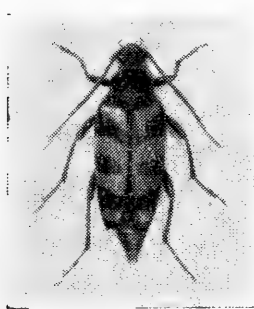
EXPERIMENTS ON COLORATION.—Dr. Saadet Ergene is continuing her experiments upon the coloration of grasshoppers. Her latest results show statistically that larvae of the very variable *Oedipoda* are capable of selecting a background to which their coloration is adapted. This is clearly an important factor in addition to their power of adapting their coloration. Their chief enemies appear to be birds. The species which she employed for her experiments was *Geronticus eremita*, which caught and devoured a far greater number of those whose coloration was not adapted. Her figures are given in *Rev. Fac. Sci. Univ. Istanbul*, B., xviii, Fasc. 1., 1953.—MALCOLM BURR.

COLEOPTERA

Some Notes on *Strangalia aurulenta* Fab.

By H. C. HUGGINS, F.R.E.S.

I recently recorded (*Entomologist*, 86: 40) the capture of five specimens of this handsome Longicorn at Glengarriff, Co. Cork. This note was sent in before I read Mr. R. S. FERRY's account (*Ent. Rec.*, 65: 26) of his unsuccessful hunt for the insect in Devon, and as my experiences do not in some respects tally with the information he collected before beginning his search a fuller account may be of interest to him and others.



life size

In July 1950 I noticed a *Strangalia* crawling on a big oak stump at the side of the Kenmare road just outside Glengarriff. This stump was perfectly sound except that a little of the bark was rotten; it had evidently belonged to a tree that had been blown down, and the stump had been sawn off about three feet from the ground. I do not know its exact age, but when I returned after some years to Glengarriff for a holiday in 1948 it was then in the same position as in 1950.

As the *Strangalia* was not familiar to me I put it in a box and noticed that the stump was riddled with holes nearly as large as a lead pencil going into the solid wood of the sawn top, which was some three feet across. A few days later I saw another of the same *Strangalia* on a ragwort flower some twenty yards from the stump.

On returning home I mislaid the beetle and saw no more of it until after nearly a year it turned up when I was moving to this address. It was then in rather poor shape, with antennae and tarsi damaged, and I did not bother any further about it as I do not collect Coleoptera although if I see a rare insect I usually pick it up to give to a friend or museum.

I did not visit Glengarriff in 1951 but when I returned in late June 1952 the stump was still there, except that it had been pushed to the opposite side of the road and was nearly as sound as ever.

On 30th June I decided to walk up the valley of the Oowenacahina river to Barley Lake and as this is a seven mile climb over bog and rock my wife agreed to walk up the road to meet me on my return instead of accompanying me. As I came home I found her sitting on the stump and she remarked, "Oh, I've sat on and squashed such a lovely beetle". I looked at the remains, which were of a very large female of my unknown *Strangalia* and decided it looked unusual, so for the next few days we examined the stump casually as we walked past, and succeeded in taking two males and three females. On my return they were identified by Mr. E. B. Britton as *aurulenta* and on being told that there were no British specimens in the general collection at South Kensington I presented all five to the Museum.

In Mr. Ferry's paper he says that Mr. Kaufman states that *aurulenta* does not lay its eggs in the log from which it emerges. This is not always the case. When I saw the first specimen in 1950 there were burrows a year old in the stump and in 1952 the 1951 burrows were unmistakable, so that *aurulenta* had emerged from this stump in 1949, 1950, 1951, and 1952.

Again Mr. Ferry constantly refers to rotting wood, and this stump, from standing on dry rock, except in one or two places is still as sound as a bell. Moreover the burrows go straight down into the solid wood from the sawn surface and seem rather to avoid the bark.

Unlike Dr. Perkins I also saw the beetle on flowers; as I have already stated, in 1950 I saw one on ragwort and on 14th July 1952 in a meadow on the Castletown road, about two miles from the stump, I saw two big females flying round and settling on the flowers of *Lythrum salicaria*, on which they appeared to be feeding as they were there for at least an hour from 11 a.m. (G.m.t.) flying actively from stem to stem in blazing sunshine. I did not attempt to take them as I already had five specimens, but I was waiting to pick up specimens of *Lycaena phlaeas* L. ss. *hibernica* Goodson, which were occasionally coming to the same clumps of flower-spikes, so saw them for some time. *Lycaena phlaeas* is decidedly rare at Glengarriff and this was a particularly fine brood, one female being indeed the largest I have ever taken anywhere, so whilst waiting I had a good opportunity of watching the beetles, which were very active in the sunshine, running up a spike and flying to the next. They evidently came from a row of small oaks with trunks about eight inches in diameter that grew some ten yards off.

I do not think that *aurulenta* is as scarce as it is usually considered as apart from my own recent capture Mr. Allan tells me there is a Berkhamsted record and Mr. H. M. Edelsten told me at the "Verrall" that some years back one was sent to him under suspicion that it was a Colorado beetle, but I forgot to ask whence it came.

[The reference to which Mr. Huggins refers is in *Entomologist* 21, 213:—"Strangalia aurulenta F.—I found several specimens of this handsome beetle beside a small beech-plantation south-west of Great Berkhamstead, on 21st and 22nd July. They seem to affect the flowers of *Scabiosa arvensis*, etc.—JOHN T. CARRINGTON. July 1888."—Ed.]

ORTHOPTERA

Some Notes on Orthoptera and Dermaptera in the West Midlands

By F. FINCHER, F.R.E.S.

These two Orders have been sadly neglected in this area, in fact Burr (1936) was unable to give any records for Worcestershire or Shropshire. Since then some have been published—Elton (1947), Fincher (1950), Kevan (1952)—but the area is still much in need of further investigation. All these notes relate to personal observations. Nomenclature is according to Hincks (1949).

Labia minor (L.) One specimen taken in early evening at Randan Wood, Bromsgrove, Worcs. on 21st July 1951.

Forficula auricularia L. Abundant in north Worcs. It has been found hiding in cracks of trees broken off by wind at twenty-five feet above ground. Though mainly nocturnal the female has occasionally been seen basking in the autumn sunshine.

Blatta orientalis L. Noted in Bromsgrove, Worcs. on several occasions.

Meconema thalassinum (Degeer). Not uncommon at Randan Wood, Bromsgrove, and has also been seen at Shrawley Wood, near Stourport, Worcs., and Long Compton, Warks. It seems to be attracted by water and quite frequently specimens have been found drowned, or nearly so, in a water tub or a small pool. Nearly all of these were males. Frequently noted on lighted windows at night, usually single, which suggests that numbers are not great or that individuals do not move far. One was found in a spider's web one afternoon still alive and apparently quite unhurt when released, though it was probably there all morning as the species is only normally active at night. Chiefly found on oak, but has also been seen on lime, plum, dog-rose, and once amongst rushes (*Juncus effusus*). The imago has been found between 26th July and 20th October. A well developed nymph was seen once as early as 9th May. The usual gait is a walk or run and when disturbed it generally drops off the foliage.

Pholidoptera griseoptera (Degeer). This species has been found chiefly alongside hedges in the district west and south-west of Bromsgrove, over an area of several square miles. The most popular sites are in the thick vegetation at the bottom of a hedge where field and road are at different levels, with a sloping bank facing the sun. The best known site is almost entirely on the north side of a main road running from west to east. It has been found in similar places just west of the Severn, between Stourport and Holt Heath in Worcs. and at Moreton Bagot in Warks. It is generally in colonies, often separated by a mile or so from the next. The area occupied varies considerably from year to year in extent, but this is usually shown by an expansion or contraction in the outer parts. Though chiefly active in the evening it is fond of basking in the sun, and a large colony is hardly ever silent at the height of the season. Perhaps about noon is the quietest time. During August 1940 when passing one colony at various times it was heard on almost every occasion, whether by night or day, though a note for 28th August

states "heard at 9.20 a.m. but not at 4.50 a.m. when it was very cold." On several other days it was heard at that early hour.

In 1949 I caught a female and released her in rough vegetation by my house. Next year several males were heard stridulating throughout the usual period and they did not wander far. They gave frequent opportunities for observation and it was noted that walking or running was the usual gait. When running the speed was quite fast and the insect looked more like a small mammal as it sped over the rough grass. Jumping seemed to be only resorted to when very closely pressed. The stridulation, though not loud, is fairly easily picked up and a colony is readily located by this means; but finding an individual is a very different matter. Extreme dates for imago, 19th July to 21st October.

Metrioptera brachyptera (L.). Plentiful in Whixall Moss, Salop, and the adjoining Fenn's Moss, Flint (detached part) in 1950 and 1951. Chiefly in the damper parts of the moss where *Erica tetralix* is common. Elton (1947) notes this species at Whixall and also *Mecostethus grossus* (L.).

[*Nemobius sylvestris* (Fab.). An immature cricket taken on 13th April 1948 at Shrawley Wood, Worcs. The specimen has been submitted to Dr. Uvarov and Mr. W. D. Hincks for examination. Both these authorities, while agreeing it is most probably this species, will not commit themselves to a definite decision as the critical tibial spines are absent, possibly owing to immaturity. As no further specimen has yet been secured it cannot be fully admitted to the list.]

Gryllulus domesticus (L.). Frequent in bakehouses, farms and rubbish tips at many places in north Worcs. In warm seasons it may sometimes be heard in hedges, usually not far from buildings, but disappears from these sites with the first frosty autumn nights.

Tetrix vittata (Zett.). Frequent in open parts of Randan Wood, Bromsgrove, in just such spots as Lucas (1920) describes, "A warm margin of a wood, where the soil is only partly covered with vegetation." Here it is regular and has been seen in every month except December and January, though the usual period of activity is from late March to mid October, depending on the weather. Burr (1936) refers to members of this genus being found on mild winter days, and so some attention has been given to this point. In 1947 a few were noted up to 12th November and a later search found one in thick cover of dead brushwood and leaves on 23rd November. There were many bright sunny days that winter but no more were seen until 1st March. In 1945 one was seen on 2nd February. On several occasions it has been seen feeding on small mosses. This agrees with Verdcourt (1947) on the food of this species. It has also been found in grassland at Purshull Green, Worcs., and on a dry weedy field at Bickenhill, Warks.

Omocestus viridulus (L.). Common in north Worcs. between Bromsgrove and Kidderminster. When this group was first studied in 1937 this species seemed to show a slight but definite preference for damp grassland, but since then it appears to have become more common and may now be found in some dry areas. An interesting point is that in a small woodland clearing in front of my house, previously occupied commonly by *C. bicolor* and a few *C. parallelus*, the present species has now replaced *C. bicolor*, though in other places the two frequently occur together. *C. parallelus* still exists in small numbers as before. The only

change in vegetation is that I have eradicated bracken, formerly very abundant, and there is now a better growth of grasses and other low-growing plants.

On 31st July 1947 a variety was found at Randan Wood, a female very similar to one described by Lucas (1920): a purple stripe down the centre of the pronotum, a purplish flush along the whole of sides of abdomen, and upper sides of hind femora. The anal region of the elytra and the rest of the pronotum were green. A nymph seen at Hartlebury Common, Worcs., was entirely a rich reddish-plum colour, save for the underparts. Also found at Whixall Moss, Salop, in a very damp grass area, on Cleeve Hill, Glos., and at several places in north Warks. Extreme dates for imago, 6th June to 5th October.

Chorthippus bicolor (Charp.). Very common in Bromsgrove district and other parts of north Worcs., chiefly in dry uncultivated places and roadsides. Also noted at Hopwas, Cannock Chase and Rowley Hills in Staffs., at Wyre Forest and Whixall Moss in Salop, and several places in Warks. On several occasions this species has been seen to adopt a slightly different method of feeding from that described by Lucas. It bit right through a blade of grass and, turning the piece right round, nibbled away at the bitten edge, holding it with the anterior pair of legs.

Another incident was rather amusing. Two males were serenading a female, the latter quietly feeding. A second female approached and one male transferred his attentions to her. He went up rather close to her but was pushed away by a hind leg. Then he came round nearer her head, whereupon she brought her hind leg smartly upward and over, giving him a sharp tap on the head with her knee. After this he retired. Lucas remarks that this species does not seem to like woods, but at least in this district it has been found in woodland clearings. Extreme dates for imago, 2nd July to 28th October.

Chorthippus parallelus (Zett.). Very common in north Worcs., with a preference for grazing land. Two specimens have been seen with red colouring: a male with the hind legs almost completely red and a female with brick-red dorsal surface, the remainder of the body being bright green. On one occasion five males were seen stridulating together on one dock leaf, apparently with no female in sight. It can swim well if by chance it gets into water. Also seen at Whixall Moss, Salop, and Sperrall, Warks. Extreme dates for imago, 27th June to 28th October.

Myrmeleotettix maculatus (Thunberg). In Worcs. this species has only been found on light sandy ground at Hartlebury Common and similar ground nearby. There it is mainly found where there is a thin growth of heather and grass but also on a very boggy site at Hartlebury. It also occurs commonly on grassy slopes on the Longmynd in Salop, on Whixall Moss, Salop, and the adjoining Fenn's Moss in Flint. This latter district is an extensive tract of boggy ground on thick peat with vegetation of boggy or heathy types according to the wetness of the soil.

On 23rd September 1947 two were seen on a patch of burnt heath near Kidderminster. The soil was still covered with a layer of fine black ash but new growth of heather and gorse was shooting up from the old roots, so the fire could not have been recent. Both specimens blended perfectly with this background. This was not due to contamination with the ashy ground as appeared probable at first. A closer examina-

tion showed that though the female was all black it really was her proper colour. The male was not so completely black as the tip of his abdomen was reddish, and there was a white spot on each elytron and a white edge to the rear half of the pronotum. The female repeatedly inserted the end of her abdomen into the loose soil, so presumably she was ovipositing.

Burt (1951) comments on this correlation of colour with burnt surroundings in African acridids and gives further references. Lucas (1920) also mentions dark or almost black specimens on burnt ground. At South Haven Peninsula, Dorset, Diver and Diver (1933) found wet situations almost completely avoided. Parts of the bogs at Hartlebury and Whixall where it occurs are very wet with patches of standing water. Extreme dates for imago, 2nd July to 23rd September.

Anacridium aegyptium (L.). One found in Birmingham in December 1951 near the wholesale market, and subsequently brought to me, was most probably a casual importation with produce.

REFERENCES.

- Burr, M. 1936. *British Grasshoppers and their Allies*. London.
 Burt, E. 1951. The ability of adult grasshoppers to change colour on burnt ground. *Proc. R. ent. Soc. Lond.*, **26**: 45-48.
 Diver, C., and Diver, P. 1933. Contributions towards a survey of the plants and animals of South Haven Peninsula, Studland Heath, Dorset: III. Orthoptera. *J. anim. Ecol.*, **2**: 36-69.
 Elton, C. 1947. Some Orthoptera from Shropshire and Pembrokeshire. *Ent. mon. Mag.*, **83**: 42.
 Fincher, F. 1950. *Trans. Worcs. Nat. Club*, **10**: 165-166.
 Hincks, W. D. 1949. Dermaptera and Orthoptera. *Handb. Ident. Brit. Ins. R. ent. Soc. Lond.*, **1** (5): 1-20.
 Kevan, D. K. McE. 1952. A Summary of the Recorded Distribution of British Orthopteroids. *Trans. Soc. Brit. Ent.*, **11**: 165-180.
 Lucas, W. J. 1920. *A Monograph of the British Orthoptera*. London.
 Verdcourt, B. 1947. A Note on the Food of *Acrydium* Geoff. (Orthoptera). *Ent. mon. Mag.*, **83**: 190.

DIPTERA

The Hover-flies (*Syrphidae*)

By L. PARMENTER, F.R.E.S.

(Continued from page 126).

LARVAE.

In a family of insects with such a variety of life histories as the Syrphidae have, it is to be expected that adaptation has produced a number of types of larvae. These, however, are not quite so obvious as the habits would lead one to expect. They fall roughly into three groups:—(a) the aphidophagous and phytophagous species, (b) the saprophagous and coprophagous species and (c) *Microdon*.

The APHIDOPHAGOUS type is a sub-cylindrical larva with 12 segments, the anterior portion being attenuated and retractile. They are generally semi-transparent with the internal digestive organs, etc., observable. The larva is blind but has mouth hooks which are struck into the victim. The segments generally carry rough bands, often with spines which assist it as it creeps along with a slight looping action. A pair of spiracles is situated anteriorly. There are posterior spiracles on a chitinous plate which are so shaped as to be characteristic of each species.

The larvae are often greyish in colour but in some species they are brightly coloured by reason of tiny globules under the outer skin.

The SAPROPHAGOUS type has a larvae with the 'rat-tail'. It is cylindrical with a bluntly rounded head and at the other end has a long drawn-out tube that is partly retractile and forms the breathing tube, bearing at the end the spiracles and a whorl of setae. It is astonishing how far these tails can extend when tested in a jar of water by raising the surface by the addition of more fluid. Those with much shorter tails inhabit rotten wood, the longer extensile-tailed species living in muddy, foul water or liquid mud. The body segments have paired prolegs, absent in the aphidophagous type. At the anal end, before the base of the 'tail', there is, in some species, a group of thin bladder-like processes whose function is problematical. The anterior spiracles are present but do not project very much.

In *Microdon*, the larva is like a slug, quite different from all other Syrphid larvae. In fact, originally, the larva was first described as a mollusc. They have no indication of segments but retain the paired posterior spiracular plates. The larvae live in the nests of various species of ants feeding on the pellets ejected by their hosts.

The rat-tailed maggots of *Eristalis* and *Helophilus* breathe through the extended tail-tubes as they creep over the floor of the pond or ditch. As the time for pupation approaches they climb out of the water. A larva of *Eristalis sepulchralis* L. found caught in the ice covering a pond was enclosed in a small collecting tube partly filled with water. The larva climbed out of the water, pupated on the cork at the top and eventually the fly emerged!

The larva of *Merodon equestris* F. on emergence from the egg makes its way to the base of the bulb. By entering here, the grub reaches the centre without going through the many layers of skin. The first fortnight is spent at the base of the bulb and then, as the larva increases in size, it feeds upwards, sometimes leaving the bulb and attacking a nearby sound bulb. The time taken during the larval period may be as long as 300 days, almost the whole of its life.

The larvae of *Catabomba* (= *Scaeva*) hatch in 4-6 days. The grub creeps, lifting its anterior portion of its body, feeling with the tip. When an aphid is found the mouth hooks are inserted and the contents are sucked out. The body of the aphid will be seen to be emptied. It will be raised, brought forward towards the fly-grub and when but an empty shell, be cast off, often behind the larva. Regurgitation takes place and the fluid appears to flood the aphid's shell before being sucked in again and as Tilden has suggested, probably assists in digesting the contents of the green-fly's body. The larvae of various species of *Syrphus* act similarly. Rearing these larvae will show how ravenous they can be. I have seen over 20 aphides dealt with by one grub in a day, but Tilden has recorded 73 sucked by one grub in 24 hours! To see one tackle seven green flies in a row, empty them and toss the shells away, as if over its shoulder, is to see one of the most efficient weapons against an aphid infestation at work. Their influence in dealing with these pests of the garden and field must be very considerable.

They will tackle other insects and in the wild I have seen them sucking lepidopterous larvae and have had them suck portions of freshly killed flies in captivity.

Callicera rufa Schum. lives as a larva for two years or more. *Syrphus ribesii* L. and *vitripennis* Mg., *Platychirus*, *Doros conopseus* F. and *Baccha* have been found hibernating as larvae, pupating in the early spring. The larvae of *Pocota* and *Myiatropa* live in the wet wood mould of hollows in beech and elm trees. Prof. Varley has found the larvae of *Chrysogaster hirtella* Lw. under water fastened to the stems of the grass *Glyceria* through which they breathed.

PUPAE.

These are found in the soil, in rotten wood, rotten vegetation, on growing plants, in nests of Hymenoptera but not in water. The water-frequenting larvae crawl out for pupation. The larva shrinks, the skin hardens and becomes the outer covering of the pupa. The spiracles are extruded and appear to be placed on plates in various ways so that each species seems to have a characteristic pattern. In *Syrphus*, the larva often contracts to form an object somewhat like a tear-drop. The pupae are brown in colour, varying in tint as between species and as to age. Both *Syrphus luniger* Mg. and *corollae* F. have been found hibernating as pupae.

ADULTS.

These have been well described by Verrall and Lundbeck, and odd species by later authors. One need but call attention to the mouth parts which are not adapted for piercing plant or flesh and are used for sucking nectar or crushing and digesting pollen. The colour patterns in several species differ between the sexes and in various species, particularly in *Platychirus*, the males have hairs and bristles ornamenting the legs.

VARIATION.

The study of variation in Diptera has not been widespread. *Drosophila melanogaster* Mg. has been subjected to a study probably more intensive than even the Lepidoptera. In the Syrphidae, a few species have had some attention and various forms have been described and named. In *Criorrhina* and *Volucella*, each genus has a species which occurs in two colour forms. In *Volucella bombylans* L. they pair both in mixed and like forms with no intergrading. In *Merodon equestris* F., there are at least five named forms but I have seen a number that appear to be 'in-betweens'. The widespread *Eristalis tenax* L. varies in shade but the tints intergrade. In one or two species of *Syrphus* there are dark forms of apparently over-wintering individuals whilst in the genera *Catabomba* and *Melanostoma* there are melanic forms.

MIMICRY.

Many hymenopterists have taken Syrphidae by mistake, by reason of their superficial resemblance to Hymenoptera. Imms, 1947, has a coloured plate depicting a number of insects resembling bees or wasps and has selected twelve Syrphidae out of 23 of all orders. *Mallota cimbiciformis* Flin. and *Eristalis tenax* L. greatly resemble the honey bee, and *Criorrhina*, *Arctophila mussitans* F., *Merodon equestris* F., *Pocota apiformis* Schrank and *Volucella bombylans* L. are like various species of *Bombus*. *Doros conopseus* F. is probably overlooked by dip-terists because of its resemblance to a wasp. The superficial pattern

is generally aided by the habits. In *Chrysotoxum*, the yellow and black pattern, with the thin antennae stretched well in front makes the insect look like a wasp. Its activity and its 'buzz' which varies in pitch according to its speed of flight, often makes the insect appear to be an angry wasp. This mimicry by the Hover-flies of Hymenoptera is regarded as Müllerian. In Carrick's feeding experiments, 17 Hover-flies of five species were offered to a nesting pair of Wrens and a pair of Sedge Warblers. Only five Hover-flies, a *Rhingia campestris* Mg. and four out of sixteen of aposematic types were taken.

VISION.

Casual observations made in the field suggest that most species of this family are attracted to flowers and choose yellow-coloured forms in preference to others, with white flowers as next in favour. Scientific observations of Dr. Ilse have shown in the case of *Eristalis tenax* L. a definite preference for yellow flowers and proved that it was able to separate yellow from other colours. The field of study both for field-workers and experimental biologists is considerable, and all attracted to this aspect should also read Prof. Wigglesworth's chapter on vision in his *Principles of Insect Physiology*.

SCENT.

Some Syrphid larvae are said to be nocturnal, all are blind, so that recognition of their food may well be by scent. In the adults, being diurnal flyers, vision may play a very important part in their recognition of food, etc. Nevertheless, the presence of sensory pits in the antennae, which have been associated with scent, suggests that this sense of smell may aid the sense of vision.

HEARING.

Whether a fly can appreciate the sounds made by the hovering Syrphid is problematical and I have never seen any behaviour to suggest that the sounds are heard by them. But there is no doubt as to the human reaction to this hum. Several have commented on the "singing" of *Sericomyia* and of other species. Some suggestions as to how the humming notes are caused has been made. Imms appeared to favour the idea that the note is caused by vibration of the membrane situated just inside the thoracic spiracles. However, he required more proof and research.

COURTSHIP AND MATING.

Mating generally takes place in the air. The most conspicuous hovering in Syrphidae is done by the males of many genera. Along hedgerows, margins of woodland, in forest rides, and with some species in open fields, males of *Chilosia*, *Eristalis*, *Syrphus* and *Volucella*, etc., will hover, humming or buzzing, awaiting the passage of females. The approach of another fly of similar build and particularly of the same genus appears to cause a reaction in the hovering male. His note changes and he darts towards the newcomer. If the latter alights on a flowerhead or a leaf and is a female of the same species, the male will drop lower, hovering just overhead. As the female rises he will attempt to couple with her.

Much of the speed of action depends on the amount of sunshine and warmth. On the very hot sunny days, watching a flowering hawthorn, one sees numbers of *Eristalis arbustorum* L. females feeding, and with them some males. Most of the males will be darting here and there searching around the sunny side of the tree, hovering every now and then over a female. If she does not rise for a while he will dart on but if she flies off rapidly he may follow her and hover again over her on her alighting. This chase and hover pattern of behaviour may last several minutes before a coupling is attempted in the air.

Whereas in the Dolichopodidae, the males wave the ornamented legs and wings, I have never seen similar action being taken by the males of *Pyrophæna* and *Platychirus* whose fore legs are also ornamented.

Successful copulation lasts many minutes and in many cases has continued for hours.

PLAY AND FLIGHT HABITS.

Hovering males generally operate at a fair height above the ground varying with the species. The normal height of flying also varies between species. *Merodon equestris* F. keeps low over the ground. The males will patrol and hover low over the short-turfed paths in woodland and heathland. In the woods, *Brachypulpus bimaculatus* Macq. will keep to a foot or so of the ground level and the flies alight to rest on the lower portion of the trunks of the old trees of their habitat. Mr. C. O. Hammond tells me that the beautiful *Caliprobola speciosa* Rossi also keeps low and when collecting he has had the males flying around his ankles. *Eumerus tuberculatus* Rond. will also keep low over the ground and when working along a hedgebank will keep very close to its surface. *Chrysotoxum* males will work up and down sunny hedgebanks but will also fly to various umbellifers and other flowers. *Criorrhina*, *Eristalis* and most species of *Syrphus* will rise to the topmost flowers on trees.

From the pen of Mr. A. A. Allen we have had a delightfully written note on his observations of a *Syrphus tricinctus* Flin. When approaching a flowerhead it swerved to dart at a nearby flesh-fly, *Sarcophaga* sp. The Hover-fly butted the other far larger fly with its head, knocking it to the ground. This aggressive behaviour is akin to attacks made by an *Eristalis tenax* L. on a wasp, *Vespula* sp., and at passing insects by a *Chrysotoxum verralli* Collin seen by Mr. B. R. Laurence. The latter has drawn attention to the flying at moving objects which Hover-flies indulge in, a habit, however, not entirely confined to this family. It appears to be characteristic of flies that are most active in sunshine.

Possibly related habits are those I once noted whilst watching a few *Syritta pipiens* L. about a pile of rotting garden refuse. A male patrolled at about a foot from the ground around the heap, often alighting on nearby sticks, etc. Whenever another male approached, the original flew towards him, shadowed him, following or retreating as necessary, even flying backwards! As soon as the newcomer alighted, the original darted in and invariably the newcomer flew off. No attention was paid to flies of other species visiting the heap.

Rather similar behaviour was noted about a rambler rose draped over a trellis fence. A "territory" patroller driving off an intruder.

With the approach of a female to the garden heap, the male shadowed her. But the behaviour became more suggestive of "display" for the

male swung himself in an arc from side to side rather like the display made by courting *Dioctria* (Asilidae) males. This would certainly permit him to flash his silvery face and the silvered pubescent patches on his thorax and abdomen, should she have been looking. Whether these are normal behaviour habits remains to be proved. There is some fascinating watching to be done and all who can identify some of these flies should note their habits and place on record their results.

(To be continued.)

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

SELENIA TETRALUNARIA BRED FROM FORRES.—I have to-day (May 1st) bred a rather light-coloured ♀ of *Selenia tetralunaria*, from a larva taken in the Altyre Woods, near Forres, on August 29th last. The larva in question was beaten from larch, in company with such ordinary larch-feeders as *Macaria liturata*, *Eupithecia lariciata*, *Gonodontis bidentata* and *Ectropis* (*Tephrosia*) *bistortata*, but it is just possible that it had wandered or been blown from some neighbouring birch. Unfortunately it did not occur to me at the time to try whether it would thrive on larch; I think it has never been recorded from this, though well-known to be tolerably polyphagous on deciduous trees. What is the distribution of this species in Scotland? I believe in Dr. F. Buchanan White's time the only Scottish record was for Rannoch, and Mr. Barrett suggests . . . that even this requires confirmation.—LOUIS B. PROUT.

THE NORFOLK HESPERIA ALVEUS.—Mr J. Edwards . . . has examined the genitalia of one of the *Hesperia alveus*, reported some time since as having been captured in Norfolk many years previous to their having been recorded, and finds it to be really this species. He thinks that the butterfly is to be regarded as a survival of the ancient fauna of Central Norfolk and that there is no need to attempt to account for its occurrence by immigration or accidental introduction along with plants. This leaves us only two other views, viz., that the captor mixed unwittingly his Continental and British captures, or that it is a native of Cawston. If it be a native of Cawston why was the species not earlier detected, and why has the species not been since found there? Like several other common butterflies there is no reason whatever why this species should not occur in Britain, the only fact that we know at present about the matter is that it does not appear to do so.—J. W. TUTT.

[Later research showed that Mr. Tutt's first alternative was the case.—ED.]

Current Literature

THE ORIGIN AND HISTORY OF THE BRITISH FAUNA. By B. P. Beirne. Published by Methuen & Co. Ltd. London, at 18/-. With 60 maps in the text.

In the introductory chapter of this book Professor Beirne writes: "The conclusions arrived at on the origins and histories of animals as inhabitants of the British Isles are those that appear the most probable when all known aspects of the biology, distribution and taxonomy of the

animals and all available information on the past climatic, vegetational and geographical changes in the British Isles are taken into account. These conclusions are, however, often a matter of personal opinion and are consequently controversial." If the reader bears this statement in mind as he reads through this book he will not only appreciate the numerous difficulties encountered in the interpretation of the available data, but will be able to think of alternative explanations to those put forward.

The present fauna of the British Isles has been derived entirely from the Continent. There are few endemic species and these are largely confined to little known groups such as the Diptera. Of the total animal population it is estimated that about 2 per cent. were introduced by man and 35 per cent. could have been transported by aerial currents, but most of these are thought to have arrived overland. In all about 95 per cent. came mainly overland and 45 per cent. did so entirely. The reconstructions of the histories of animals as inhabitants of the British Isles are based on four types of evidence: palaeontological, historical, ecological, taxonomic and zoogeographical, especially the last three. In a great many species the evidence is incomplete and it is difficult to draw conclusions. Throughout this book Professor Beirne has put most emphasis on insects, particularly the Lepidoptera, in which he is specially interested.

The book would have been improved by the inclusion of the modern definitions of species and subspecies and other terms. Many readers will be confused to read on page 34 "sometimes the ranges of two subspecies of the one species meet, then interbreeding takes place unless the two are isolated ecologically or biologically". The significance of recent range variations of many insects (particularly butterflies) is inadequately considered and there are many other controversial points which the reader must decide about himself. A surprisingly large number of careless mistakes also occur, particularly with reference to birds and mammals.

However, entomologists will find much of interest in what is a comparatively new field in zoological research, and this book is indeed a considerable step forward into a virtually unexplored field.

D. F. O.

CORRECTION:—*Ent. Record*, 1952, **64**: 158. Pl. 6, fig. 3. The beautiful aberration cited by Bright and Leeds as ab. *extrema* is really an example of ab. *tarasina* Cabeau, *Rev. Mens. Namur.*, 1920, **20**: 19. The author does not mention the hind wings and it must be assumed that he did not consider their pattern of any importance to the diagnosis. In this specimen the pattern of the hind wings makes it ab. *postradiata* Bright & Leeds.

ERRATUM.—*Ent. Record*, 1952, **64**: 364. In the review of Dr. Kettlewell's paper on radioactivity the equation should be—

$$\frac{\text{radioactive larvae released} \times \text{total imagines caught}}{\text{radioactive imagines caught}}$$

Both the multiplication and division signs are omitted.

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Urgently required during the next few months for research purposes, pupae of *Biston betularia* Linn. (melanic or otherwise). Would be most grateful if entomologists would inform me of approximate percentages of the two melanic aberrations—*carbonaria* and *insularia* and the typical, occurring in any locality.—**Dr. H. B. D. Kettlewell**, Department of Zoology, University Museum, Oxford.

Wanted.—Butterflies of Europe, America, India and Africa in exchange for Butterflies of Malta.—**G. G. Lanfranco**, 3 New Str., Sliema, Malta, G.C.

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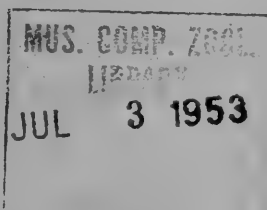
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3 1953 Aberrations of British Geometridae

By E. A. COCKAYNE, D.M., F.R.C.P.

PLATE XII.

The following aberrations with one exception are in the Rothschild-Cockayne-Kettlewell collection in the British Museum.

Lyncometra ocellata Linnaeus ab. **divisa** ab. nov.

The median band of the fore wing is divided into two parts, a costal and an inner marginal one.

Type ♂ : Caterham, Surrey, ix. 1892. Rothschild coll.

Lyncometra ocellata Linnaeus ab. **costimacula** ab. nov.

Only the costal part of the median band of the fore wing remains.

Type ♂ : Loc. incog. (Farn and Pether coll.) Cockayne coll.

Plemyria rubiginata Schiffermüller ab. **albovittata** ab. nov. (Fig. 8.)

That part of the fore wing which lies external to the median area is smoky grey, but the part between the basal and median areas is pure white. The hind wing is very pale grey with a dark border.

Type ♂ : Arran, 1893. R. Adkin coll.

Chloroclysta siterata Hufnagel ab. **caerulata** ab. nov.

The usual olive green of the ground colour and markings is replaced by blue green.

♀ : Scarborough, Yorks., bred xi.1902 by H. W. Head. (W. F. Urwick coll. Vauncey Harpur Crewe coll.) Rothschild coll.

Chloroclysta siterata Hufnagel ab. **trivirgata** ab. nov.

The normal *siterata* has blackish antemedian and postmedian lines and parallel with each of them is a thin toothed line; similarly in the basal area there is a thin line parallel with the basal line; between each pair of lines the ground colour is normal. In this aberration the space between each of these three sets of parallel lines is filled with blackish green forming three dark bands across the fore wing. On the hind wing there is a dark band limited externally by the postmedian line.

Type ♀ : New Forest, 1901. Cockayne coll.

Paratype ♀ : Loc. incog. x.1897. A. Ford. Cockayne coll.

Dysstroma citrata Linnaeus ssp. *pythonissata* Millière ab. **aurantiaca** ab. nov.

All the markings of the forewing are clear orange on a pale orange ground. The hind wing is a very pale orange with a somewhat darker orange border and fringe. The thorax and abdomen are orange.

Type ♂ : Haroldswick, Unst, Shetland. (Farn coll.) Cockayne coll.

Xanthorhoe munitata Hübner ab. **defasciata** ab. nov. (Fig. 9.)

The median area of the fore wing is bounded by the dark antemedian and postmedian lines, but there is no dark median band, the ground colour of the median area being the same as that of the rest of the wing.

Type ♂ : Mickle Fell, 18.vii.1897, L. B. Prout. Cockayne coll.

Paratypes 4 ♂ : 1 ♂ Aberdeen, 1908, A. Horne. Cockayne coll. : 1 ♂ Curtobur, 23.vii.1898. Cockayne coll. : 1 ♂ Hawick, 1907, W. Renton. Banks coll. : 1 ♂ 1886. (Sang coll.) Banks coll.

Xanthorhoë fluctuata Linnaeus ab. **fumata** ab. nov.

The whole insect, head, thorax, abdomen, and both fore and hind wing are a uniform dark smoky colour. On the fore wing the dark basal and median markings are present, the subapical mark is indistinct, and the usual wavy lines are obsolete.

Type ♂: Bexley, bred 1911 by L. W. Newman. Rothschild coll.

Paratype ♂: Loc. incog. Stevens sale no. 15230. Cockayne coll.

This melanic form is very different from ab. *neapolisata* Millière and *thulei* Prout.

Xanthorhoë fluctuata Linnaeus ab. **costijuncta** ab. nov. (Fig. 11.)

On the fore wing the basal and median areas are united along the costa by a dark stripe.

Type ♀: Colchester, Essex, 1911. R. Adkin coll.

The type shows other unusual characters. On the fore wing the median area is very dark and is broken between nervures 1 and 2, the

EXPLANATION OF PLATE XII.

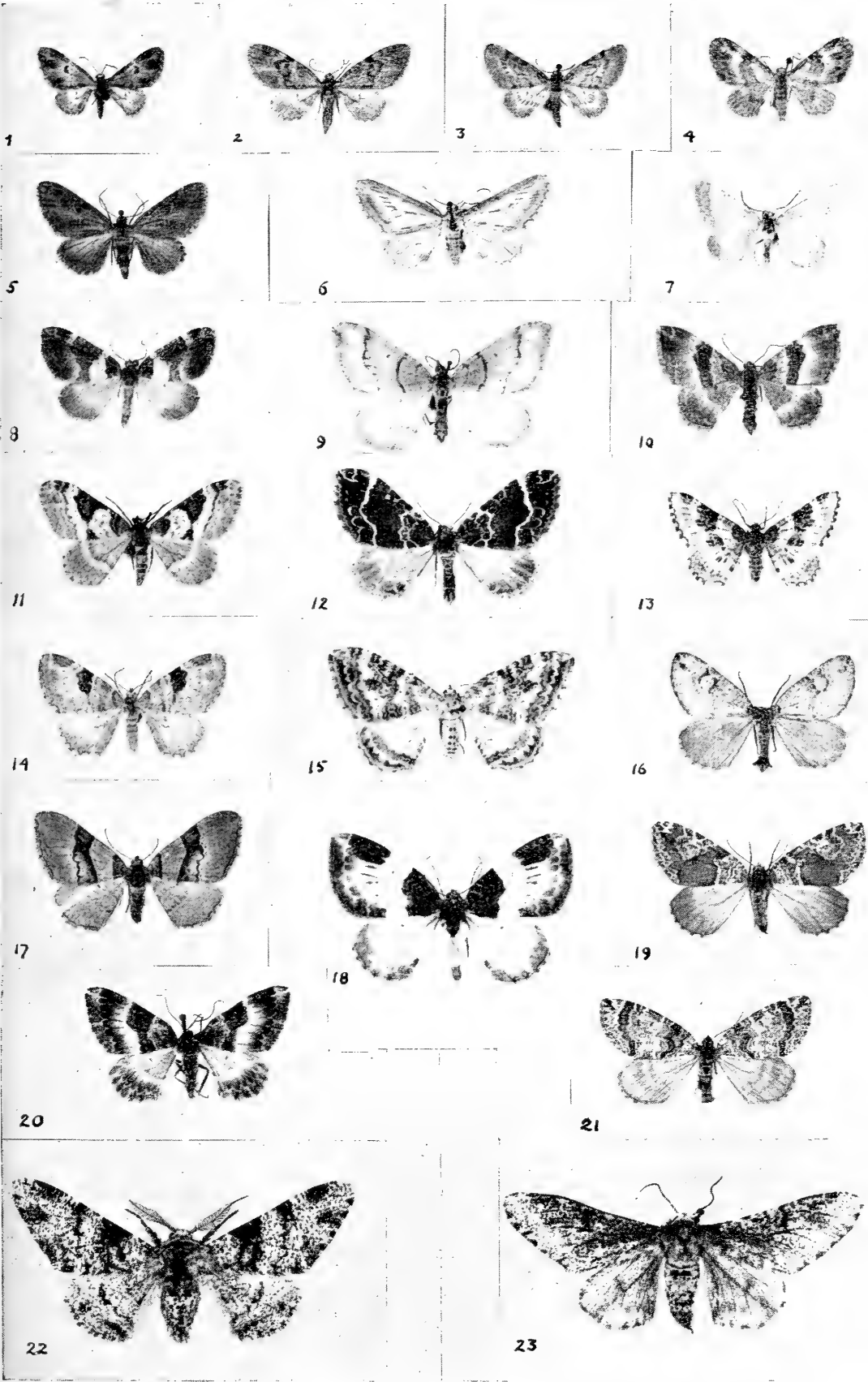
- Fig. 1. *Eupithecia linariata* ab. *punctata*. ♂. Type.
 Fig. 2. *Eupithecia lariciata* ab. *virgata*. ♂. Type.
 Fig. 3. *Eupithecia satyrata* ab. *trilineata*. ♂. Type.
 Fig. 4. *Chloroclystis rectangulata* ab. *effusa*. ♀. Type.
 Fig. 5. *Eupithecia icterata* ab. *goodsoni*. ♂. Type.
 Fig. 6. *Eupithecia extensaria* ssp. *occidua* ab. *albescens*.
 Fig. 7. *Perizoma albulata* ab. *albomedia*.
 Fig. 8. *Plemyria rubiginata* ab. *albovittata*. ♂. Type.
 Fig. 9. *Xanthorhoe munitata* ab. *defasciata*.
 Fig. 10. *Epirrhoe alternata* ab. *confusa*.
 Fig. 11. *Xanthorhoe fluctuata* ab. *costijuncta*. ♀. Type.
 Fig. 12. *Lampropteryx suffumata* ab. *edentata*. ♂. Type.
 Fig. 13. *Epirrhoe tristata* ab. *demarginata*.
 Fig. 14. *Ochyria designata* ab. *costimacula*. ♀. Type.
 Fig. 15. *Xanthorhoe montanata* ab. *reticulata*. ♀. Type.
 Fig. 16. *Hydriomena furcata* ab. *prouti*. ♂. Type.
 Fig. 17. *Euphyia rubidata* ab. *coarctata*. ♀. Type.
 Fig. 18. *Mesoleuca albicillata* ab. *rectangulata*. ♂. Type.
 Fig. 19. *Hydriomena furcata* ab. *mirabilis*. ♀. Type.
 Fig. 20. *Euphyia unangulata* ab. *effusa*. ♀. Type.
 Fig. 21. *Hydriomena ruberata* ab. *bivirgata*.
 Fig. 22. *Biston betularia* ab. *semivirgata*. ♂. Type.
 Fig. 23. *Biston betularia* ab. *suffusa*. ♀. Type.
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basal area is also very dark. The subterminal line is very distinct, the wavy lines are faint, and the ground colour nearly white. On the hind wing the postmedian line is distinct and just external to it is a conspicuous broad pale band.

Xanthorhoë montanata Schiffermüller ab. **reticulata** ab. nov. (Fig. 15.)

On the fore wing the median area is filled in with wavy lines; in the space between the basal and antemedian lines is a band formed of wavy lines giving the insect a reticulated appearance. Near the margin there are three well marked parallel lines, the outermost dentated on its inner aspect, and internal to these is a thin dark line along the termen. On the hind wing near the margin there are two parallel wavy lines and external to them is a dark band dentated on its inner aspect, and there is also a thin dark marginal line.

Type ♀: Wrotham, 28.vi.1932, J. Juby. Rothschild coll.



Xanthorhoe spadicearia Schiffermüller ab. **coarctata** ab. nov.

The median band on the fore wing is narrow.

Type ♀ : Braemar, Aberdeenshire, 1907, Bright. Rothschild coll.

Ochyria designata Hufnagel ab. **costimacula** ab. nov. (Fig. 14.)

The median band is reduced to a large dark mark on the costa.

Type ♀ : Epping Forest, Essex, 1899, O. C. Goldthwait. (Bright coll.) Rothschild coll.

Calostigia multistrigaria Haworth ab. **obscura** ab. nov.

The ground colour of both fore and hind wings is uniformly smoky grey; the median band and the subterminal band are obscured, but visible; the other markings are almost invisible.

Type ♂ : Gibside, Durham, 1906. (Dewar coll.) Cockayne coll.

Paratype ♂ : Ballaugh, Isle of Man, 15.ii.1905, Cassal. L. B. Prout coll.

This is not so dark as ab. *nubilata* Tutt, nor has it the pale dots internal and external to the median area and near the margin of the fore wing, and near the margin of the hind wing.

Lampropteryx suffumata Schiffermüller ab. **edentata** ab. nov. (Fig. 12.)

On the fore wing the postmedian line is much smoother in its curves than usual, the large double toothed projection is much less prominent and the teeth are absent, the indentation just above it is also absent or nearly absent. The ground colour is dark and the white transverse stripes bordering the basal and median areas are very conspicuous.

Type ♂ : North Wales, bred 2.v.1907. (Bright coll.) Rothschild coll.

Paratype ♂ : North Wales, 25.iv.1907. (Bright. coll.) Rothschild coll.

Coenotephria berberata Schiffermüller ab. **deleta** ab. nov.

The basal line is present, but the thin line internal to and parallel with it is absent; the antemedian and postmedian lines are present, but the lines in the median area parallel with them are absent; thus there are three single lines instead of three pairs of lines.

Type ♀ : Suffolk, 1902. Cockayne coll.

Paratype ♀ : Bury, Suffolk, bred 1903. (Gibbs coll.) Rothschild coll.

Coenotephria derivata Schiffermüller ab. **costijuncta** ab. nov.

The antemedian line is united by a broad dark band along the costa with the dark mark, which forms the upper part of the postmedian line.

Type ♂ : Ashridge, Herts., bred 8.iv.1946 by E. A. Cockayne.

Coenotephria derivata Schiffermüller ab. **nigrofasciata** ab. nov.

There is a broad dark band running longitudinally from the antemedian to the postmedian line and occupying the anterior half of the median area, from the costa to nervure 4, and there is another band in the median area powdered with black scales running along the inner margin.

Type ♀ : Cranleigh, Surrey, 1906, F. Pennington. Cockayne coll.

Euphyia unangulata Haworth ab. **effusa** ab. nov. (Fig. 20.)

On the fore wing the median band is unusually narrow; the parts normally white are cream coloured; the subterminal line is very dark and ill defined and on its inner side it encroaches on the light area outside

the median band and runs inwards along the nervures; the faint dark transverse line just outside the median band is absent. The ground colour of the hind wing is cream and the subterminal line is broad and ill defined on its inner side.

Type ♀ : Hants, bred 1906 by C. R. N. Burrows. Burrows coll.

Euphyia rubidata Schiffermüller ab. **coarctata** ab. nov. (Fig. 17.)

The median area is about half the normal width and is bounded externally by a complete black line from the costa to the inner margin.

Type ♀ : Loc. incog. 1879. (Waring coll.) Rothschild coll.

Ecliptopera silaceata Schiffermüller ab. **melaleuca** ab. nov.

The ground colour is pure white instead of cream colour and the markings are intensely black.

Type ♂ : Aston Hills, Bucks., 6.v.1945, A. L. Goodson. Cockayne coll.

Mesoleuca albicillata Linnaeus ab. **rectangulata** ab. nov. (Fig. 18.)

The dark basal area is larger than normal and the dark subapical mark on the costa is rectangular and much longer than usual so that the white space between them is much reduced; the nervures from the postmedian row of dots as far inwards as the end of the subapical mark are darkened forming a row of short lines; in other respects it is normal.

Type ♂ : Folkestone, bred 1882 by Blackell. R. Adkin coll.

Epirrhoë tristata Linnaeus ab. **demarginata** ab. nov. (Fig. 13.)

The dark markings on the border of the fore wing are greatly reduced, only a faint trace of brown remaining and a little darkening of the nervures; the dark markings on the border of the hind wing are reduced but not to the same extent.

Type ♂ : Rannoch, vi.1907, A. E. Gibbs. Rothschild coll.

Allotype ♀ : Rannoch, vi.1905, E. A. Cockayne. Cockayne coll.

Epirrhoë alternata Müller ab. **confusa** ab. nov. (Fig. 10.)

The median band of the fore wing is narrow; the border is dark and suffused internally, fading away gradually into the white ground colour shortly before reaching the postmedian line; there are none of the normal reticulations and the dark line just external to and parallel with the postmedian line is absent. On the hind wing the basal part is dark as far out as the postmedian line and the marginal area is similar to that of the fore wing. The aberration has a dark smoky suffused appearance.

Type ♂ : York, E. G. Pether. Cockayne coll.

Paratypes 2 ♂♂ : 1 ♂ Loc. incog. Sale Stevens 1900. Christy coll.
1 ♂ Isle of Lewis, 1887, McArthur. Rothschild coll. The last belongs to ssp. *obscurata* South.

Perizoma albulata Schiffermüller ab. **albomedia** ab. nov. (Fig. 7.)

The median area is white and entirely without markings; the basal and marginal markings are present.

Type ♂ : Shetland, 1907, P. M. Bright. Rothschild coll.

Allotype ♀ : Same data.

Paratypes 2 ♀♀ : Same data.

Perizoma affinitata Stephens ab. **effusa** ab. nov.

On the fore wing the marginal area has a suffused appearance and is not sharply defined internally fading away into the white, which borders the postmedian line; the thin dark line which normally runs parallel with and just external to the postmedian line is absent.

Type ♀ : S. Devon, 22.v.1911, J. W. Metcalfe. Cockayne coll.

Hydriomena furcata Thunberg. ab. **goodsoni** ab. nov.

The ground colour of the fore wing is dull pale brownish green; the basal line is dark; there is a broad almost completely unicolorous blackish brown median band reaching the discoidal spot, a subterminal band, and a submarginal band, both of the same colour; the border is usually the same colour as the ground.

Type ♂ : Loc. incog. (Bright coll.) Rothschild coll.

Allotype ♀ : Loc. incog. Banks coll.

Paratypes 1♂ 2 ♀♀ : 1 ♂ Watergate, Emsworth, Hants., vii.1897, W. M. Christy: 1 ♀ Loc. incog. Burrows coll.; 1 ♀ Aston Hills, 12.vii.1944, A. L. Goodson. Cockayne coll.

The type is figured, Barrett, Pl. 368. Fig. 1 f.

Hydriomena furcata Thunberg ab. **barretti** ab. nov.

Similar to ab. *goodsoni* except that most of the anterior (costal) half of the pale band external to the median band is clouded with dark brownish green.

Type ♂ : Loc. incog. (H. B. Williams coll.) Cockayne coll.

Allotype ♀ : Loc. incog. (Bond, S. Webb, Willoughby Ellis coll.) Cockayne coll. Paratypes 2 ♂♂, 1 ♀ : 1 ♂ Stone, vii.1885. (Farn. coll.) R. Adkin coll.: 1 ♂ Loc. incog. Burrows coll.: 1 ♀ Kingsdown, 19.vii.1932, J. Juby. Rothschild coll. The allotype is figured, Barrett. Pl. 369. Fig. 1 b.

Hydriomena furcata Thunberg ab. **mirabilis** ab. nov. (Fig. 19.)

The ground colour is whitish suffused with rufous in the distal areas; the basal area has dark transverse lines, the more distal ones more or less fused to form a band; the antemedian line has a V-shaped indentation about a third of the way across the wing; the median area extending from the antemedian line internally to the outer aspect of the subterminal band, which is close to the anal angle, and from the inner margin to nervure 3 is uniformly dull brownish grey; from the proximal end of this an oblique band of the same colour runs to the costa. These bands, and the median area together with the costa enclose an irregular area of the ground colour in the proximal part of which lie six dark spots speckled with whitish and at the distal end is a narrow doubly angulated band first running towards the termen, then away from it, and then towards it again, parallel with the inner aspect of the subterminal band. The border of the termen is dark and in the narrow belt of ground colour between it and the subterminal band are a number of small dark spots. The pattern is unlike that of any other aberration of this species.

Type ♀ : Meltham, Yorks., 3.ix.1903, W. Tunstall. Prout coll.

Hydriomena furcata Thunberg ab. **supercincta** ab. nov.

The ground colour of the fore wing is dull pale greenish white; the basal area is dark and unusually broad; there is a very broad dark

median band; the subterminal line is absent; outside the median area there is a broad band of pale ground colour, the terminal band is dark.

Type ♂ : Meltham, Yorks., 3.ix.1903, W. Tunstall. Prout coll.

Hydriomena furcata Thunberg ab. **prouti** ab. nov. (Fig. 16.)

The ground colour of the fore wing is whitish faintly tinged with greenish brown; there are three equidistant indistinct narrow transverse bands pale greenish brown in colour; at the extreme base is a thin black transverse line; a thin black transverse line, slightly curved with the concavity towards the termen, runs from the subcostal nervure to the median nervure and another thin black line runs obliquely from a point near the costa to the subcostal nervure and then in a curve, with the concavity towards the base, to the median nervure; the second faint transverse band runs just internal to the one and the third transverse band runs just external to the other; there is also an indistinct narrow band of brownish green along the termen; the fringe is chequered. The hind wing is dull greyish brown and is darker than the fore wing.

Type ♂ : Meltham, 1896, Tunstall. Prout coll. B.M. 1939-643.

Hydriomena ruberata Freyer ab. **bivirgata** ab. nov. (Fig. 21.)

The fore wing is pale grey resembling ab. *grisescens* Huene except that the space between the first and second bands, which are grey and inconspicuous, is darkened and forms a conspicuous band, and the subterminal line forms another conspicuous dark band; the apical mark is also dark.

Type ♂ : South Sutherland, 1892. (Salvage coll.) Christy coll.

Allotype ♀ : Borobol, Sutherland, 14.v.1899, W. M. Christy.

Paratype ♂ : Same data.

Hydriomena ruberata Freyer ab. **unilineata** ab. nov.

The fore wing is almost unicolorous pale grey with a thin dark oblique line near the base, a dark mark external to it on the inner margin, and a small dark apical mark; the usual indistinct transverse lines are absent or obsolescent.

Type ♀ : Wallasey, 1895. Cockayne coll.

Hydriomena ruberata Freyer ab. **constricta** ab. nov.

The pale band in the middle of the fore wing is very narrow.

Type ♂ : Isle of Lewis, Hebrides, 1901. (McArthur coll.) Rothschild coll.

Hydriomena ruberata Freyer ab. **nigrocastanea** ab. nov.

The ground colour of the fore wing is uniform dark red brown with the usual markings present but inconspicuous.

Type ♂ : Middlesborough, bred ix.1907, by E. A. Cockayne.

Allotype ♀ : Middlesborough, bred 29.xi.1907, by E. A. Cockayne.

Paratypes 2♂♂ 2♀♀ : 1♂, 4.x.1907; 1♂, 8.x.1907; 1♀, 4.x.1907; 1♀, 29.x.1907, all bred by E. A. Cockayne from Middlesborough eggs sent by J. W. Heslop Harrison.

Hydriomena ruberata Freyer ab. **marginenotata** ab. nov.

This is a grey form like ab. *grisescens* Huene, but with a row of conspicuous black marks along the termen.

Type ♀ : Warrington, 1898, H. Massey.

Eupithecia linariata Fabricius ab. **punctata** ab. nov. (Fig. 1.)

On the fore wing the basal line is reduced to a spot on the costa and the median band is reduced to a central spot and a small mark on the inner margin.

Type ♂ : Brighton, bred vii.1919, T. S. R. Adkin coll.

Eupithecia pulchellata Stephens ab. **guttata** ab. nov.

On the fore wing the ordinary markings are very faint, the median area is slightly paler than the rest of the wing, but the discoidal spot is black and conspicuous. The hind wing is similar, but with a smaller discoidal spot.

Type ♀ : Lydd, Kent, 3.viii.1932, A. J. Bowes. Bowes coll.

Eupithecia satyrata Hübner ab. **trilineata** ab. nov. (Fig. 3.)

The ground colour of the fore wing is unusually pale, but the antemedian and postmedian lines are thick and strongly developed; the median line is distinct, but less conspicuous. On the hind wing the antemedian and postmedian lines are thick and nearly as dark as those of the fore wing; the discoidal spot is distinct on both wings.

Type ♂ : Abbot's Wood, Sussex, 4.vi.1924, R. Adkin. R. Adkin coll.

Eupithecia satyrata Hübner ab. **nigra** ab. nov.

The head, thorax, wings, and abdomen are nearly black with the markings just visible.

Type ♂ : Paisley district, 1902, A. M. Stewart. (Determined by L. B. Prout) Prout coll.

Eupithecia icterata de Villers ab. **goodsoni** ab. nov. (Fig. 5.)

This is a modification of ab. *subfulvata* Haworth. The costa of the fore wing is entirely dark, lacking the usual pale lines. Below the median nervure and on each side of nervure 2 is a longitudinal band of fuscous crossed transversely by pale lines; the wavy submarginal pale line is indistinct and the pale marginal lunules are absent. The hind wing is darker than normal and the usual markings are almost absent.

Type ♂ : Tring, Herts., bred 14.vi.1945 by A. L. Goodson. Cockayne coll.

Eupithecia extensaria Freyer ssp. *occidua* Prout ab. **albescens** ab. nov. (Fig. 6).

The transverse bands are very pale and weakly marked or obsolescent. It is an albinistic form.

Type ♂ : Thornham, Norfolk, bred 25.v.1932 by E. A. Cockayne.
Allotype ♀ : Same data.

Paratypes 1♂, 3 ♀♀ : 1♂, bred 9.v.1932; 1 ♀, bred 28.v.1932; 1 ♀ bred 5.vi.1932; 1 ♀, bred 19.v.1932 by E. A. Cockayne, all from Thornham. Mr. Prout did not think this form identical with ab. *leuca* Dietze from the Illi and Ussuri districts.

Eupithecia abbreviata Stephens ab. **nigra** ab. nov.

Every part of the insect, head, thorax, wings, and abdomen are black with the markings on the wings almost obliterated.

Type ♂ : Tring, Herts., bred 7.iv.1945 by A. L. Goodson.

Allotype ♀ : Brickhill, Bucks., bred 7.iv.1945 by A. L. Goodson.

Paratypes 2 ♂♂, 2 ♀♀ : 1 ♂, Tring, 4.iv.1946, A. L. Goodson; 1 ♂, Brickhill, Bucks., 7.iv.1945, A. L. Goodson; 1 ♀ Forest of Dean, 30.iii.1938, A. Richardson; 1 ♀, Forest of Dean, 11.iv.1938, A. Richardson. Cockayne coll.

Eupithecia lariciata Freyer ab. **virgata** ab. nov. (Fig. 2.)

The median and postmedian lines are strongly developed, closer together than usual, and united on the costa; the space between them is largely filled with dark scales in the posterior part of the wing.

Type ♂ : Perth, 9.v.1896. Christy coll.

Chloroclystis rectangulata Linnaeus ab. **effusa** ab. nov. (Fig. 4.)

The median area is narrow and darkened, clearly bounded by the antemedian and postmedian lines with the discoidal spot situated in the latter; the marginal area also is darkened, but all the narrow transverse lines are absent and it has a suffused appearance. Just external to the discoidal spot is a whitish mark ill defined externally.

Type ♀ : N. Cornwall, 14.vii.1902, J. Greenwood. (Bright coll.) Rothschild coll.

Chloroclystis debiliata Hübner ab. **albescens** ab. nov.

Ground colour very pale, whitish with a slight tinge of green; all the normal markings present, but scarcely discernible, very pale grey with a slight sandy tinge. It is an albino.

Type : ♂. Ummera, Co. Cork. 1.vi.1926, larva, Donovan. Donovan coll. B.M. 1952-93.

Biston betularia Linnaeus ab. **albapicata** ab. nov.

A black form like ab. *carbonaria* Jordan, but with the apex of the fore wing white lightly speckled with black like typical *betularia* and an insignificant peppered patch on the termen between nervures 3 and 4. The costal part of the hind wing is speckled with white. There is a white spot at the base of the forewing as in ab. *carbonaria*. The head is white and the collar black with a white edge.

Type ♀ : ? Tilshief, 1925. Cockayne coll.

Biston betularia Linnaeus ab. **semivirgata** ab. nov. (Fig. 22.)

The first and second lines are united to form a large black mark on the costa of the fore wing. The hind wing is normal.

Type ♂ : Epping, 4.vi.1906, ex Lewis. Cockayne coll.

Allotype ♀ : Bexley, bred vi.1903. B.M. 1937-45.

Paratypes 2 ♂♂ : 1 Epping, 4.vi.1906, ex Lewis. Cockayne coll. 1 Lewisham, 31.v.1892. R. Adkin coll.

Biston betularia Linnaeus ab. **suffusa** ab. nov. (Fig. 23.)

The fore wing has black speckles tending to become confluent longitudinally especially in the space posterior to the median nervure. The marginal area is white with a few scattered black scales; the interneural black spots on the termen are well developed and the discoidal spot is large. On the hind wing the discoidal spot is very large; there is a broad ill-defined band running from the inner margin to a point opposite the discoidal spot, at which point it is almost united with two of the ill defined interneural spots on the margin. There are black scales along the median nervure and nervures 1, 2 and 3 as far out

as the transverse band, a few scattered black scales in the cell and many more between the median nervure and nervure 2 and the inner margin. The rest of the wing is almost white. The head is white, the anterior part of the thorax is black, and the posterior part is whitish, and the abdomen is white with a thick black band across the middle of the dorsum of somite 2, and black scales along the posterior border of the terminal somites.

Type ♀ : W. Bowater coll.

Some Observations on *Vanessa cardui* L. and its Migrations in 1952

By VERA MOLESWORTH MUSPRATT, F.R.E.S.

Vanessa cardui L. arrives at St. Jean-de-Luz annually in May; my earliest date before 1952 is the 6th, but they usually come more in the middle and latter half of the month, and in June I generally see most. The butterflies are few in number and the first ones in May are often colourless, small and generally worn; as time goes on they have more colour (pink) and seem larger; towards the end of June and sometimes in July one sees a few large ones which are in a good condition; however, an absolutely fresh specimen is a rarity. These differences of colour, size and freshness make me think that they must be migrants that dribble north to us from different broods. In 1950-51-52 I was here all July and was able to ascertain that *cardui* fades somewhat out of the picture in that month. In July 1951 I saw seven in all, and on the 20th two seemingly in perfect condition. There is no doubt that this corner of France is rarely favoured by *cardui* in numbers, and then they seem only to pass through without laying, or laying only very occasionally. I have never found any caterpillars, although there are numerous artichoke fields where large broods could be reared.

In 1946 a fair quantity of *cardui* turned up here in June. The first ones were seen on the 3rd; on the 7th, on a front of about 800 metres, 63 were seen by Mr. G. Adkin and myself. They were mainly feeding on privet flowers and were all in a lamentable condition, torn, rubbed, faded, and with two exceptions having hardly any colour at all in their wings. They remained in numbers till the 27th; on that day Mr. Adkin saw 30 on a 300 metre front; on the 28th he saw only two in the same area. A few were observed daily till the 3rd of July, then no more. I had left for the Pyrenees on the 25th June but Mr Adkin carried on with his observations. These migrants were in such a dreadful condition that I think they must have died off very quickly, but this sudden disappearance makes one wonder.

On one other occasion I have seen *cardui* in numbers here, but it was something like 25 years ago and I think it was in June. I remember taking the dogs for a run on the cliffs about 7.30 one evening before dinner. When I got up to the cliffs I came upon a very great number of beautiful large brilliantly coloured *cardui*; they were all over a part of the cliffs in a square of roughly 100 metres and seemed to be settling for the night on the bushes. I had no net with me and decided to go back next morning to pick and choose. Alas, there was no picking and choosing; at nine the following morning not a *cardui* was left!

I see extremely few *cardui* here in the autumn. During six years of observation I have never seen any in September; 4 in 1947 on the 16th and 17th October; 2 in 1951, one on the 16th of October and the other (a great surprise) on the 28th of November. This butterfly was completely scaleless, and I was able to identify it only by the shape of the wings.

I was camping from the 25th of September to the 6th of October 1952 in the Pouey Aspé valley above Gavarnie (Htes. Pyrenees), and on the 26th at about 1,900 m. altitude I saw two *cardui*, looking very fresh and going leisurely up the valley; they rested continually but each time they moved they went up. I lost them after they had gone about 500 metres towards the pass. I saw no others later.

This unsolved problem of the southern return journey of some lepidoptera that migrate north had puzzled me in 1946 with respect to *Celerio lineata livornica* Esp., which like *cardui* seem to migrate unreasonably, as they too appear to make no return journey. In the *Revue Française de Lépidoptérogie*, XII, p. 117, I ventured to suggest a possible reason for this behaviour: after the last glaciation the climate became temperate as at present, then there came a much warmer (Boreal) period than that which obtains to-day; during that warm period *livornica* and *cardui* were perhaps forced to leave North Africa because of a possible lack of food for them and their progeny, and the last autumnal brood bred in the north returned regularly south. I think it is certain that both *cardui* and *livornica* go north regularly every year, but their northward limit, and the numbers in which they come, depend on circumstances which so far have not been fully ascertained. In the present era both these species seem incapable of continuing to breed successfully up north in sufficient time to return south; their present northward migrations are I think the continuation of habits contracted during a warmer period. If these two species had now to depend on this southern migration in the autumn, as they may have had to do at one time, both would now be extinct.

There is another point of interest as concerns the present time: where do the *cardui* come from that I see here in the autumn and which Lieut.-Colonel N. Eliot sees at times in numbers in the same season at Cavalaire (Var)? It is of course possible that Colonel Eliot's *cardui* are bred in the district of Cavalaire, but I wonder if some of these butterflies have not come south. Perhaps in some regions of France they do manage that autumnal brood which does come south. They could very well produce this brood at St. Jean-de-Luz as our autumns are magnificent and long; but they are not here to lay.

On the 15th of March 1952, a sunny morning with the thermometer at 15° C. in the shade, I was very surprised to see a *cardui* in my garden. It was small, colourless and somewhat torn; on the 22nd I saw another one in the same condition.

Captain Dannreuther kindly informed me on the 23rd March about the very unusual early invasion of this species in the south of England. He asked me if I knew of their appearance at that early period (end of February) in any region of France. I had then heard nothing, but some months later I received a letter from M. Lévesque at Niort (Deux Sèvres) telling me that *cardui* had turned up in his region unusually early, namely the end of February and early March: "They were in

the same condition as those that arrive annually about the 15th of May, i.e. in fairly good condition. These butterflies were less numerous in March, but reappeared in numbers about the 6th of April in a very bad condition. A new migration must have taken place at the beginning of May as they became numerous again and were in their usual condition for that time of the year".

This early appearance of *cardui* in the west of France coincides with their early arrival in England. In a letter dated 5th July Captain Dannreuther told me that the Director of Climatology at the Meteorological Office had said that at that period anticyclones over the west Mediterranean produced wind conditions favourable for insects to be carried from North Africa round Spain to the British Isles in about three days. At St. Jean-de-Luz we had a quite cold period with no breaks all January and February till the 2nd of March, so that *cardui* was very unlikely to have come up from Spain or Africa over the western Pyrenees to reach Deux Sèvres at the end of February, and I therefore suggest that these butterflies seen in the west of France may have been part of the contingent that might have reached England carried by the wind.

Though the night had been cold (3° C.) on the 2nd of March at St. Jean-de-Luz, the day temperature rose to 20° C. in the shade, and with the exception of a period from the 16th to the 21st which was either overcast or wet, the month was warm with many sunny days. I saw only 8 *cardui* in March; in April, 12; on the 8th Mr. G. Adkin saw four and said that a couple seemed to be thinking of mating, which made me hunt later in the artichoke fields for caterpillars, but without result. On the 29th I was about 10 kms. S.S.E. of St. Jean-de-Luz and saw in ten minutes 5 *cardui* flying over a depression at an altitude of 230 m. between two hills. They were flying very fast and heading E.N.E., one after the other. Though I remained up there some time after seeing them no others passed.

June was hot, with a few quite hot days. On the 5th, with a shade temperature of 32° C., I and my daughter at 2.30 p.m. counted 82 *cardui* along our road on a front of about 250 metres. They were busy feeding on privet flowers in the hedges. All were in excellent condition and brilliantly coloured, but none were large, just a medium size. They had not been there at noon that day. I heard later that they had been "all over the place" in the town that day. On the 6th, a fine day but muggy, 24° C. in the shade, they had practically gone. I found only four where we had seen the 82 on the previous day. After this invasion on the 5th I saw 18 others in June, 3 in July and 2 in August, and those two were the last I saw here in 1952.

M. de Puységur of Montpellier (Hérault) sent me two interesting letters about *cardui* in 1952 together with some specimens which he had caught. He wrote that: "This species was not rare round Montpellier at the end of March and beginning of April" and that the specimens seen were fresh, seemingly bred in the area. On the 14th of April in the afternoon there was an unbelievable number of *cardui* coming from the E.N.E. and going W.S.W.; the greatest number was seen between 4.0 and 4.30 p.m. flying between St. Mathieu-de-Trévier and Prades-le-Lez near Montpellier. In the few square yards in which M. de Puységur observed them 90 specimens were passing in a minute and at times they

were uncountable. The butterflies were flying between 70 cm. and 1 m. 50 cm. above the ground; temperature 20° C. in the shade and there was a faint breeze. Cars in that region were all bespattered with the bodies of these butterflies with which they had come into contact. After this enormous passage numerous very worn *cardui* remained in the area. At the beginning of May they were again in great numbers, small in size and very fresh (probably they had been bred in the area), together with others that were larger and mostly in a poor condition. The specimens which M. de Puységur sent me corroborated his remark about their condition.

M. de Puységur also told me of another observation sent to him by M. Thermes who said that on the 13th-14th April he saw uncountable numbers of *cardui* in Pyrénées Orientales and that a gentleman who was driving from Carcassonne (Aude) to Montpellier had had the windscreen and bonnet of his car covered with their corpses when he arrived at Montpellier.

The direction of flight on the 14th April near Montpellier seems a curious one. Maybe the Cévennes had something to do with it, though they are not close, but I believe they had a lot of snow that winter and perhaps the *cardui* may have turned back on their tracks when they got nearer these mountains, having sensed the cold. However, they were flying north in the department of Ardèche, N.N.E. of the Herault, as the following observation shows. Dr. H. Cleu of Aubenas, Ardèche, writes: "Since about the 8th April I have seen an unusual number of *cardui* flying generally north. On the 26th, on the road from Lavedieu to Aubenas, I saw them flying for threequarters of an hour over rocky scrubby land, one after the other at the rate of about one a minute. The procession stopped as the sun went down."

Lt.-Col. N. Eliot of Cavalaire has very kindly sent me an account of the way *cardui* behaves in his area. This is what he says: "The presence or absence of *V. cardui* in my garden at Cavalaire, Var, was recorded from about mid-October to mid-June every year from 1936 to 1939 and for every whole year from September 1946 to October 1952, during which period some reports were also obtained from the near vicinity. During the nine springs involved there were only six migrations into this region. Of course in the three blank years immigration may have taken place elsewhere along the French Mediterranean coast. This possibility is supported by evidence from 1946 onward which points to *cardui* being present hereabouts every autumn, often in considerable numbers. No spring immigration was noted in 1938-47 and 50, but during the winters commencing in 1938-48 and 50 *cardui* were seen from time to time in practically every November, December and January, these being succeeded by a few fresh looking individuals in April before any sign of immigration had been noted. Thus it would seem that the low ground along the French Mediterranean coast is about the northern limit where the species can occasionally carry on from year to year.

"In April and May 1952 a migration of *cardui* was seen coming in from the sea; they just appeared on the scene. On the first three occasions they were flying wildly and erratically, although often settling on the ground.

"After each influx the butterflies soon dwindled in numbers to nearly zero. They were mostly small and of a yellowish tinge, a few faded and

rather worn, but from the first there were among them individuals which were rather larger and of a fresh rosy tint, the proportion of these gradually increasing.

"After a sunny week when no *cardui* were seen, on the 11th April some 8 or 9 were seen simultaneously on a small terrace. The sea was calm and thin clouds were moving from the east. Only half that number were seen next day, which was overcast with large rollers from the east. On the 17th only one was seen.

"After a calm hazy day on the 21st there was a drizzle from the east on the 22nd and a large influx appeared flying wildly and erratically. Many were still present on the 24th, but four days later all were gone.

"There was another influx on Mayday when the butterflies were notably numerous. The morning was sunny and calm, but during the afternoon rain drifted in from the east. On the 3rd July only 4 were counted.

"Finally, a fair number were seen flying fast to the north on May the 18th, which was mainly overcast with easterly airs."

M. F. Dujardin of Nice (Alpes Maritimes) reports: "At the end of April 1952 great quantities of *cardui* were seen in some artichoke fields at St. Paul (A.M.) about 20 km. from Nice. From what the peasants said they had seen some thousands flying about the middle of these fields but could not say from which direction they had come. Apart from having noticed these butterflies they paid little attention to them, until later they found innumerable tiny caterpillars which were devouring the plants growing in the middle of the fields, just when the artichokes were almost ready to be cut. Every day more and more of the leaves were eaten until there was nothing left except the artichoke themselves, and even these were nibbled. I called up the Station Experimentale d'Antibes and M. Pussard came over at once. Thanks to him great quantities of the caterpillars were killed, but some escaped and butterflies emerged from these later. It was the middle of May when the greatest number of caterpillars were seen, and such were their numbers that they could be distinctly heard eating."

From M. Storace of Genoa, Liguria: "*Vanessa cardui* is still migrating (10th June), coming in from the sea. I have unfortunately no time for observations, but my brother tells me that on the 21st May there was a big migration going north up the Arquata Scrivia valley (north of Genoa). A friend of mine, M. Mussa, saw two big migrations coming in from the sea at Genoa on the 28th of May and 7th of June. The first migration took place at night: he saw the butterflies by the lights of the eastern side of the port. The second one was in the same area but in the afternoon; there was a rather strong wind blowing at the time from the S.E. He had also noticed great numbers of *cardui* at Finale, Liguria, between Savona and Alassio."

The observation that follows has no bearing on the European invasion of 1952 but it is interesting as it shows that *cardui* did not only go north from North Africa but went south as well.

M. Ph. Bruneau de Mire, Algeria, writes: "I have been travelling in the Sahara in all directions for six years, going as far south as the tropical region, and though I have seen *cardui* almost everywhere they have been isolated specimens. This year, 1952, I was struck by the great profusion of this species at the Poste de Djanet, Tassili, n'Ajjer.

They were feeding on the flowers in the gardens of the Poste. I found no caterpillars, though I saw traces of something that had eaten *Euphorbia guijoniana*; but would *cardui* larvae eat this plant? (I do not think so.—V.M.M.). This quantity of *cardui* at Djanet gave me the impression of being a local swarm."

I wish to thank very much all the lepidopterists who have so kindly sent me their observations and hope this small contribution will help to map the movements of *Vanessa cardui* in 1952.

Macrolepidoptera in North East Derbyshire : A Record for 1952

By J. H. JOHNSON.

(Continued from page 137)

Abrazas sylvata. (130). May 14th. July 6th. I searched particularly for this species this season and I discovered two new localities. One of these rejoices under the name of Astwith Dumbles and is a large well-established stretch of woodland near Heath. The other is in Langwith Wood and has almost been destroyed by lumberjacks.

Abrazas grossulariata L. (150). July 2nd. July 14th.

Ligdia adustata Schf. (1). June 3rd. This specimen was found among spindle bushes in Langwith Wood.

Cabera pusaria L. (Myriads). May 27th. July 15th. Every birch bush sheltered several imagines.

Deuteronomos alniaria L. (2). September 11th. September 16th.

Selenia bilunaria Esp. (11). April 10th. July 26th. There were obviously two broods.

Gonodontis bidentata Cl. (3). May 18th. May 26th.

Colotois pennaria L. (1). October 26th. Found on street lamp near Tupton Park.

Crocallis elinguaris L. (26). July 22nd. July 30th. This is an exceptional number for one year. Usually only one is taken.

Opisthograptis luteolata L. (38). May 17th. June 27th.

Itama wauaria L. (7). July 4th. August 22nd.

Theria rupicapraris Schf. (30). February 18th. February 23rd.

Erannis leucophaearia Schf. (8). Feb. 22nd. March 2nd. These were found after very careful search of oak trunks in Brittan Wood. None was found anywhere else.

Erannis marginaria Fab. (10). February 28th. April 17th.

Erannis defoliaria Cl. (4). November 14th.

Phigalia pedaria Fab. (18). February 23rd. March 17th. Not one ♀ was discovered. All the males were taken at street lamps, on which they are fond of resting. Eight were melanic, the rest were normal.

Biston betularia L. (2). July 4th. July 9th. Two females were found at rest on the road near Heath School at 9.0 a.m. by boys. One of them produced 1,200 eggs, all fertile. They hatched on July 15th and fed up happily on birch. When some of the larvae were released in the garden they chose sycamore, horse chestnut, guelder rose, or michaelmas daisy for their foodplants. They were extremely slow feeders and many were still feeding on September 20th.

All imagines taken in this district are var. *doubledayaria*; a few males taken in Hardwick Wood have white patches on their underwings.

Alcis repandata L. (5). July 2nd. July 25th.

Ectropis bistortata Göze. (2). May 29th. June 29th.

Ematurga atomaria L. (Myriads). May 17th. June 10th. Every heather bush on Beeley and Darley Moors held several specimens.

Lithina chlorosata Scop. (Myriads). May 10th. June 4th. This species is abundant in Hardwick Wood and on all moors.

Zygaena trifolii Esp. (Myriads). June 27th. July 29th. This species has increased considerably in the last few years. There are now colonies on every piece of waste land and pit-tip.

Hepialus humuli L. (9). June 11th. July 18th.

Hepialus lupulinus L. (17). May 18th. June 5th. This species is usually abundant over the whole area, many imagines come to light and are found near windows in the daytime.

There are many other species which have been found in other years, but I have refrained from including these since my aim has been to record the state of the macro-lepidoptera in an area well known to me in the year 1952. It is axiomatic that an insect population is in a state of flux from year to year, and if more residents in inaccessible spots which look just right for "good things" could be persuaded to maintain regularly either a light trap or a few "sugar posts" under the supervision of some enthusiastic entomologist, some valuable ecological data would no doubt be collected; as H. T. Stainton optimistically stated in 1854, the harvest will soon be gathered in.

Such a project as the above is probably no more than a pipe dream, but one of my thrills this year was to find in the Journal of the N.E. Derbyshire Field Club for 1907 that Samuel Hooke, entomologist, had found *Abraxas sylvata* Scop. in Langwith Wood. I found the moth just as he described. In the same way I found *Lithomoia solidaginis* Hb. at rest on the trunks of the trees in Beeley Plantation exactly as the old headmaster described them. He also described how the hillside near Hardwick Wood was swarming with thousands of specimens of the Oil Beetle. I am afraid that he was mistaken in his identification or some catastrophe has wiped out the species. There were, however, scores of *Melolontha vulgaris* flying among the birch bushes at dusk. It is possible that these notes may at some later date please another aurelian.

Phragmatobia fuliginosa L. Reared in Uganda

By D. G. SEVASTOPULO, F.R.E.S.

The finding of a ragged, but lively, female *P. fuliginosa* in a spider's web at Polzeath in North Cornwall during a short home leave in July 1952 gave the suggestion of seeing whether rearing several generations in Uganda would tend to produce the southern European form *fervida* Staud. In other words to determine whether the differences between nomino-typical *fuliginosa* and *fervida* were of genetic origin or otherwise.

F1 generation—Some forty ova were laid and the resulting larvae fed up on a mixture of various Compositae until they were in their last instar. At this stage, in the middle of September, they were flown out to Uganda, and they, and their descendants, were fed on the leaves of one of the large tree Groundsels (*Senecio* sp.), which came origin-

ally from the Kenya Highlands. Roughly half the larvae spun up shortly after arrival and, on 5.x.52, when the first imago emerged, there were twenty-four cocoons and twenty larvae in diapause. These cocoons produced 16 males, 7 females and one dried up larva. On 7.x.52 nine of the resting larvae were put in a domestic refrigerator for a week in the hope that their pupation might be speeded up. There was no response, however, and all the larvae that went into diapause, with the exception of two, died. Those that were damped went mouldy and those that were kept dry shrivelled up. The last two pupae produced males on the 23 and 24.x.52, and may really have been delayed members of the first batch. All the imagines were normal.

F2 generation—A brother to sister pairing was obtained between two moths emerging in early October. One small batch of ova was retained and all the others destroyed. The larvae were reared without casualties and began to spin on 8.xi.52, several still having an instar to go. Emergences began on 20.xi.52 and the first batch had all emerged by 27.xi.52, when ten larvae were still feeding. These latter fed until early December and then went into diapause and died. Seven pupae died and the imagines were evenly divided between the two sexes. All, again, were normal.

F3 generation—A brother to sister pairing was again obtained and larvae hatched on 28.xi.52. Spinning commenced on 19.xii.52 and, by 28.xii.52, when the first imago emerged, there were 17 cocoons and 4 larvae still feeding, which spun up shortly afterwards. No larva of this brood showed any signs of going into diapause. Sexes were about equally divided and all were of the usual English form.

F4 generation—Two brother to sister pairings were obtained and ova were laid on 31.xii.52. Larvae fed up well and none showed any signs of going into diapause. Emergences commenced on 3.ii.53. All imagines were normal and sexes about equally divided.

Two pairings were obtained between females of one of the F4 broods and males of the other, but all the ova failed to hatch, bringing the experiment to an end.

Four generations are hardly enough to draw solid conclusions but it does not seem as if the increased red colour of the hind-wing of *fervida* can be ascribed to temperature or to more rapid development.

It is probably worth recording that all four generations were reared under the strictest security and I can guarantee that no ova, larvae or imagines were allowed to escape to found a colony in Kampala.

Kampala, 31.iii.53.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Whittleia retiella Newm. From the end of May until the end of June this quaint looking little Psychid is to be found on saltings, usually on the drier parts where wiry grass grows. It flies only in the sunshine and, until its appearance is familiar, is apt to be overlooked. The first two I ever obtained, on Iwade saltings near Sittingbourne, Kent, were both captured at lunch-time by my wife, one settling on a table-napkin and one on her white frock. I have no doubt there were others about

but I saw no more; later, when I got used to its appearance, I could usually net a dozen on a sunny afternoon. It may also be captured by sweeping the grass, but being fragile is apt to be ruined in the process.

I think *retiella* is found on most saltings on the east and south coasts; it is certainly to be found from Cliffe to Ebbsfleet in Kent and from Harwich to Canvey in Essex. The first Essex specimen was taken by the Rev. C. R. N. Burrows on the spot now occupied by the Southend-on-Sea bandstand. We live in an age of progress . . .

Phalonia mussehlana Treits. The capture of this obscure Tortrix by Mr. J. D. Bradley at Ballylickey near Bantry in June 1952 is the first I can recall since I took one at Deal in 1922. Mr. Bradley's capture confirms the western distribution of the moth, the Deal locality, unfortunately now destroyed, being the only eastern one I know. The others recorded are in Devon, Wales, and Sligo, Ireland, where I have little doubt it is widely distributed as it likes wet heavy fields with poor vegetation, such as abound in the west of that country. There is no reliable account of its life-history and as it is normally double-brooded so that larvae would not have to be carried over hibernation it is to be hoped an energetic collector may fill the gap.

Eucosma simplana F. v. R. This very beautiful little Tortrix is to be found in scrub aspen in the last two weeks of June. It is practically impossible to take except where the aspen growth is from four to eight feet high, when it may very occasionally be beaten out on a warm afternoon but may much more easily be caught buzzing round the bushes at early dusk, when its creamy-white colour distinguishes it from *neglectana*, which usually accompanies it but looks dirty-white.

I know only one locality for *simplana*. I was told it in strict confidence and visited it twice but always found the aspens in the wrong stage and got none.

I then went to live some distance away and could not visit the place at random, but one day I received a letter from a well-known collector, now deceased, who was as fond of informing friends of his captures as he was reticent of the localities where they were made.

The letter after certain captures at Folkestone stated "Also, not at Folkestone, I yesterday took five *simplana*". This was enough for me; I knew the wood was now at the right stage of growth, and the following Sunday (24th June 1930) I arranged for a car to bring me home at late dusk and captured 17 *simplana*, 3 by beating and 14 flying over the aspens; I could have taken more had I wished. I did not tell my informant (who was, of course, unaware that I knew the place) of my luck; it would have been too like seething a kid in its mother's milk.

I should, however, not despair of finding *simplana* in any ancient Kentish woodland at the right time of the year and in the conditions given above, as its former distribution was much wider, Darenth, Stone, etc.

Eucosma demarniana F. v. R. may be found in old woodland in Kent in June (Blean, Ham Street and probably many others). It sits high in the birch trees and may be beaten with a pole, or, if the trees be young enough, dislodged by kicking the trunks. Towards dusk it flies slowly round the birches, usually high, but if watched will often descend

low enough to be captured. It seldom seems to frequent birches below 15 feet in height, but on the one occasion I found it so doing it was easy to take as it is a slow flier.

Current Notes

The use of the m.v. lamp as an aid to collecting is becoming increasingly, and deservedly, popular—as popular as the invention of sugaring became a hundred and ten years ago and for the same reason. It is devoutly to be hoped that it will not have an aftermath which would deprive this country of its position in the world of lepidopterology. It is no exaggeration to say that throughout the nineteenth century England was first and foremost among the nations in this branch of Entomology, and that position was held not by virtue of scouring foreign countries for moths and butterflies hitherto undescribed but by our lepidopterists working out the life-histories and variation of species and, latterly, their genetics, which of course can only be done by breeding them.

Will the widespread use of the m.v. lamp make the catching of cabinet specimens so easy that collectors will not “bother” to search for Lepidoptera in the field? Will some, or even many, say: “Why should I waste a whole afternoon in searching tree-trunks for *Stauropus fagi*, and perhaps find one or two, when I can take my m.v. lamp in the car to that wood and catch twenty or more *fagi* in half an hour?” If this viewpoint is adopted to any considerable extent it will be a bad thing for the science of lepidopterology in this country. In a recent issue of this magazine a valued and experienced contributor wrote of the “mere accumulation” of cabinet specimens “which, let’s face it, is horribly prevalent to-day.”

It is a disquieting thought. Our contributor went on to ask “Is it too much to hope that the rising generation of moth-hunters . . . will develop a more enquiring turn of mind and use their energies in useful research rather than in filling their cabinets?” We devoutly hope that this speculation will be substantiated; for it is to “the rising generation of moth-hunters”, most of whom already use the m.v. lamp, that we older field workers must hand on the torch. Perhaps this new method of catching moths will not abase our pursuit any more than did the invention of sugaring. But we cannot help wondering sometimes whether most of our readers do not consider our “Practical Hints” as so much space wasted. An appeal for paragraphs under that heading made in these pages last year did not bring a single reply. Is this a straw . . . ?

One of our Tettigoniids, the bush cricket *Roeseliana roeselii* Hagenbach, has arrived in Canada. Writing in the February issue of *The Canadian Entomologist* (85: 78) F. A. Urquhart and J. R. Beaudry record seven specimens (all males) in the province of Quebec last July. “It was most likely introduced into Quebec by aircraft because the specimens were taken near the airports of Montreal. In view of the wide distribution of this species in Europe, where it occurs in considerable numbers, it is believed that it will become well established in Quebec and will eventually extend its range over much of the Eastern United States and Canada.” Of *R. roeselii* Burr (*British Grasshoppers and*

their Allies, 1936, p. 146) remarks: "with us this species appears to be restricted to the East Coast, from Herne Bay to the Humber. I have never heard of any record far from the shore, and it is to be looked for in damp grassy fields."

One of our old subscribers and a staunch supporter of the *Record* has just sustained an unfortunate loss. He writes: "A month or so ago a friend asked me if I could lend him one of my *Plusia ni*, to show to someone for comparison with other *Plusia*. I may say that the said *P. ni* were bred from larvae kindly sent me by my good friend F. H. Lees of Maidencombe. This I did, and on the return of the insect, while replacing it in my collection, my 'specs' fell off my nose and alighted among my *Plusia*. The result *might* have been worse, as the *P. ni* did not suffer, but my *P. festucae* suffered very badly indeed, as did the *P. chrysitis*. The latter can be replaced from the valerian in the garden, with luck, but not the *festucae*, a species which does not occur in my district." If any brother lepidopterist should have eggs, larvae or pupae of *P. festucae* to spare this coming season we should be glad to put him in touch with our contributor.

Notes and Observations

A SPRING NIGHT IN DERBYSHIRE.—Although the conditions were not as favourable for insects as I should have liked them to be on the evening of April 8th, the thermometer registered only 45° F. at 7.30 p.m. the relative humidity was 70%, and the barometer was fairly high, I decided to try the Tilley Lamp in a part of Hardwick Wood which had seemed particularly warm and pleasant in the morning sunshine. The lamp was lit and the sheet set by 8.0 p.m., but no insects were attracted, not even a gnat before 9.0 p.m. I decided to walk with the lamp to another part of the same wood where moths can always be found, in spite of its seeming drawbacks. I walked along the North Easterly edge of a thirty year old larch plantation which contains a few beeches, oaks and birches. I took 3 *Orthosia gothica* L., and 1 *O. incerta* Hufn., in a few minutes. I then noticed that numbers of *Calostigia multistriqaria* Haw. were sitting on the grass under the larches and several *Erannis progemmaria* Hb. were resting on the branches. On the trunks of the larches were sitting a varied selection of *Ectropis bistortata* Göze. I boxed the first 10 and examined them carefully later. I made slides of the male genitalia and compared them with the drawing made by W. H. T. Tams in *The Journal of the Amateur Entomologists' Society*, Vol. 5, p. 19, and it is obvious that all the specimens I took are *E. bistortata*. Of the ten, five resembled *E. crepuscularia* ab. *delamerensis* White, one had forewings part pale, part melanic like *crepuscularia* ab. *varia* Ckyne., one was very pale, and three were quite ordinary. Although all were found on larch trunks, other trees are close by, so there is no reason for believing that the larvae fed on larch.

None of these moths were attracted to the Tilley light.

On the way home I searched the street lamps. High up on one lamp I noticed a small Geometer, I could not make up my mind what species, so I decided to take a closer look. First of all I saw an *Earophila badiata* Schf. on the post in the shadow, then an *Erannis marginaria* Fab. (*progemmaria* Hb.) and then my gaze stopped at the first 'Oak

Beauty' I have ever seen in this district. I have searched for it many times, and now I am pleased to record *Biston strataria* Hufn. (*prodromaria* Schf.). I completely forgot the small Geometer at the top of the post which for some unknown reason has always been well favoured by moths.

Last year, the owner of the nearby house asked me one night why I was so fond of his lamp. When I told him it was a good place for moths, he took it as an insult to the cleanliness of his garden. He cut down his hedge, weeded his plot and thoroughly tidied the place up to clear out the vermin. I was afraid he had succeeded, but I am pleased to say that there are still twice as many moths at that lamp as at any other along that road.—J. H. JOHNSON, 53 Knighton Street, Hephthorne Lane, Chesterfield. 12.iv.53.

PIERIS RAPAE L. AT SEA IN APRIL.—I have recently received a specimen of *Pieris rapae* which was caught on board the Kentish Knock Lightship (51° 39' 24" N., 01° 40' 48" E.) on 15th April 1953. The butterfly appeared during a N.N.E. Force 4 wind and is likely to have been an early immigrant from the Continent. The vessel is stationed well out to sea in the Thames approaches, the nearest point of land being the North Foreland, 22 miles away.—D. F. OWEN, Edward Grey Institute, Botanic Garden, Oxford.

THE M.V. LAMP IN UGANDA.—The m.v. light seems to be repeating its home performances here. I took over Baron de Worms's lamp and have been able to send both the British Museum and the Nairobi Coryndon Museum series of a Syntomid (*Paramelisa lophura* Auriv.) of which neither had a specimen. It comes five or six every evening, so must be quite common.—D. G. SEVASTOPULO, Kampala. 8.iv.53.

BATS AT THE M.V. LAMP.—My moth trapping has degenerated into a nightly feast for the bats—vultures assembling to a carcass in the desert might be an appropriate simile so numerous and determined are they in fulfilling their instincts. If one moth in ten gets into the trap we are lucky, speaking both for moth and recorder. In weather conditions that bring out more night-flying insects everywhere there would be no need for my robber horde to concentrate on the one temporarily productive spot in the neighbourhood.

One little long-eared bat hung himself up in my porch to digest his supper, and not having a 'killer' nature I couldn't carry out my blood-thirsty threats against his tribe on such a confiding creature—a fellow moth-hunter! M.v. light induces no disabilities in the bats' nervous system; they fly to and fro and in and out of the illuminated area as fancy or the flying insects take them, and picking up grounded moths with astonishing dexterity is an additional accomplishment I had not hitherto given them credit for.—FRANK H. LEES, The Gables, Maidencombe, Torquay, Devon. 8.v.53.

INCIDENCE OF CERTAIN AGROTIDS YEARS AGO.—I have read with interest 'An Old Moth-Hunter's' note on the incidence of certain Agrotids before the invention of sugaring (1842) and agree that the 'garden moths' may have become more common as the human population increased. But I fear this is an over-simplification. *Cirrhia gilvago*

Schf., *Anaplectoides prasina* Schf., *Amphipyra tragopoginis* Cl., *Aporophylla lutulenta* Schf. and *Diarsia brunnea* Schf. (to mention only those referred to in my paper), which were also accounted great rarities in Haworth's time, could hardly be called 'garden moths' nor has there been any considerable increase in the usual foodplants of any of them these last two hundred years.

In the *Zoologist* of January 1846 Newman printed a paragraph headed *Capture of Rare Moths, near Lyndhurst in the New Forest* sent to him by a correspondent who stated "A friend of mine has taken the following moths from sugar placed upon trunks of trees near Lyndhurst . . . which I select from the list as worthy of being recorded on account of their rarity." The list included *Thalpophila matura*, *Hydraecia oclea*, *Anchoscelis litura*, *Eupsilia transversa*, *Agrochola lota*, *Allophyes oxyacanthae* and *Graptolitha ornitopus*. Does the 'Old Moth-Hunter' suggest that all these species were actually rare in 1845? Again, in 1849 J. B. Hodgkinson, sugaring at Carlisle, took one hundred and twenty specimens of *Amathes depuncta* L. and remarked "this insect was lately doubted as British, and four specimens only had been heard of" (*Zoologist* 2755). This is essentially a woodland species and therefore unaffected by the human population.

On 'An Old Moth-Hunter's' analogy all these species should be rarer, not commoner, to-day since such vast areas of waste lands (supporting their foodplants) have been 'reclaimed' this last century and a half. As for *Polychrisia moneta*, Delphinium is not its only foodplant and if this had not been available the moth might have oviposited on something else. A late Editor of this magazine once told me that he had found the young larvae of *P. moneta* on wormwood in his garden at Stroud.—P. B. M. ALLAN, 4 Windhill, Bishop's Stortford, Herts.

SPHINX LIGUSTRI L. IN NORTHAMPTONSHIRE.—To follow up Mr. A. A. Allen's note in the April issue (*Ent. Rec.*, 65: 118) I should like to record my observations on this species in the above-mentioned Midland county for 1951 and 1952. I took 3 and 4 moths respectively in my m.v. light trap, which was used every night and all night in my garden from early spring each year to late autumn. The dates are as follows:—16.vi.51 (1); 8.vii.51 (1); 9.vii.51 (1); 16.vi.52 (2); 22.vi.52 (1); 7.vii.52 (1). The numbers are of course small, but this may well be due to the unsuitable locality for the light trap. The balanced time of appearance, however, would suggest, to me at least, that *S. ligustri* is established in this area.—P. J. GENT, 3 Irthlingborough Road, Wellingborough. 22.iv.53.

FORMICA RUFA L. ATTACKING A SPIDER.—While picking up a dozen larvae of *Arctia villica* along a dry sunny bank on 11th March I saw a seething mass of wood ants (*Formica rufa* L.). They were evidently engaged in nefarious work of some kind, so I disturbed the centre of their activity, rather expecting to find the remains of a *villica* larva. Instead of this I disclosed what was left of a medium-sized spider. There must have been literally hundreds of ants surging round it, and there certainly could not have been "fair shares for all." It was rather surprising that such an active creature as a spider had not been able to escape from the ants. These insects are no friends of the lepidopterist. When beating for larvae in the New Forest, where they abound, one

often receives a shower of them in the beating-tray, and perhaps a few down one's neck. They cannot sting, but indulge in what Dr. Imms called "a form of chemical warfare" by discharging formic acid from one end, while at the other they are equipped with sharp mandibles (*Insect Natural History*, 1947, p. 288). Last October, when beating for larvae of *Atolmis rubricollis*, I noticed that they were slow to attack some brown Geometrid larvae in the tray, but when a half-grown larva of *Lophopteryx capucina* L. appeared and I was about to replace it on its tree, three or four ants immediately fell upon it before I could stop them, and despatched it without delay. I suppose they were attracted by the conspicuous bright green colour of the larva.—H. SYMES, 52 Lowther Road, Bournemouth. 19.iii.53.

AN UNUSUAL PAIRING.—While collecting in Dunsfold wood near Chiddingfold on 11th April 1953 I was surprised to find dislodged from the willows a male *Orthosia stabilis* paired with a female *Xylocampa areola*. Both, however, did not survive long. It was incidentally a very good night for the willows. Among a host of common insects we took one *Jodia croceago* and four *Gypsitesa leucographa*, including three females. *O. gracilis* was quite numerous.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 28.iv.53.

LEPIDOPTERA IN RENFREWSHIRE: ADDITIONS TO THE LIST.—Since my list of Renfrewshire Lepidoptera was printed in *Ent. Rec.*, 63: 130, I have added a few more species. These are as follows:—

- D. elpenor*. 2 larvae and 1 imago.
- M. stellatarum*. 1 imago.
- A. putris*. 3 imagines.
- A. prasina*. 1 imago.
- H. bombycina*. Uncommon.
- P. literosa*. 1 imago.
- E. silaceata*. 2 imagines.
- T. firmata*. Fairly common locally.
- C. coronata*. 1 imago.

Of the above, *A. putris*, *A. prasina*, *E. silaceata*, and *C. coronata* were attracted with an ultra violet ray lamp. The use of this lamp also showed up *G. papilionaria* and *O. sambucaria* as fairly common, and two others, *A. glareosa* and *A. nigra*, appeared to be fairly plentiful. The lamp was used over a white sheet and not as a trap.

So far as butterflies were concerned no new species turned up, but *A. selene* appears to be spreading as it was found in quite a few new localities during 1952. *N. io* appeared to be holding its own and *V. atalanta* was rather more plentiful, but *L. phlaeas* was not anywhere like its usual numbers at the Michaelmas daisies in the autumn.—ALAN M. MACLAURIN, Oldhall House, Kilmacollm, Renfrewshire. 13.iv.53.

EARLY APPEARANCE OF ODONTOSIA CARMELITA IN THE SOUTH.—On the night of 15th April 1953 I was surprised to find a fresh male of this species in my mercury vapour trap here. It was the first specimen I had taken in this locality, Horsell Common, and the earliest date I have known for this species. My previous earliest record was five examples in Swinley Forest on 25th April 1933. I took another male in the trap

on 26th April.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 28.iv.53.

ODONTOSIA CARMELITA IN THE NEW FOREST.—While searching large birches between Lyndhurst and Brockenhurst on 19th April 1953 I was very gratified to find a female of this species with wings still limp a foot from the ground on the north side of the trunk. The time was 12.30 p.m. B.S.T. Attempts to assemble with it both in this locality and on the following night at Horsell failed to attract any males. The following Sunday, 26th April, while searching in the same spot in the New Forest I came across another female about 5 ft. up on a large birch. This one laid freely.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 28.iv.53.

LONDON MOTHS.—I am getting together material to write up the moths of the London Area as a sequel to the Butterflies of this region which appeared in *The London Naturalist* for 1949. The boundary of the area is a circle with a radius of 20 miles from St. Paul's Cathedral. Any special records of captures within this area would be most welcome, especially those relating to Inner London or to the immediate vicinity of the Metropolis.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 28.iv.53.

LAPHYGMA EXIGUA ON THE ISLE OF CANNA.—A specimen was taken in my moth trap in July 1952; I am obliged to Mr. Tams for identification.—J. L. CAMPBELL, Isle of Canna. 29.iv.53.

EARLY APPEARANCE OF D. CONSPERSA.—A specimen was taken in my m.v. trap on the morning of 27th April 1953.—J. L. CAMPBELL, Isle of Canna. 29.iv.53.

LATE SPRING IN E. EUROPE.—Having had a miserable April we are now having a cold, cloudy, damp May. After a few bright days we have had to go back to fires. Wistaria only just in bloom. Everything 2-3 weeks late.—MALCOLM BURR, Insirah Sokagi 34, Bebek, Istanbul. 6.v.53.

EIGHTH ANNUAL CONGRESS OF BRITISH ENTOMOLOGISTS.—At the invitation of the Entomological Section of the Yorkshire Naturalists' Union this Congress, organised by the Society for British Entomology, will be held in Leeds, 10th-13th July 1953. Lectures, etc., will be held in the University of Leeds and visitors from a distance will be accommodated at the Weetwood Hall of Residence at an inclusive charge of £3 2s. 6d., from Friday dinner to Monday lunch.

On the Sunday a Field Meeting will be held at Askham Bog, York (a famous fenland with a rich and varied fauna), and provision is made for the ladies to look round the ancient city of York. On Monday morning a visit will be paid to the Orchid nurseries of Messrs Mansell & Hatcher, Ltd., Rawdon.

Programmes of the Congress can be obtained from Mr. W. D. Hincks, University Museum, Manchester, 13, or from Mr. S. C. S. Brown, Hon. Secretary, Society for British Entomology, 454 Christchurch Road, Bournemouth, Hants. These Congresses are open to all persons, of either sex, who are interested in British entomology.

NEUROPTERA

Neuroptera in Gloucestershire

By A. F. PEACEY, F.R.E.S.

The Order Neuroptera seems to have been sadly neglected by entomologists in Gloucestershire. An extensive search of entomological publications has, so far, revealed only four published records for the county, all of which refer to the same species. Killington, in his monograph of the British Neuroptera 1936-37, mentions only twelve species as occurring in Glos. out of a total of 53 for the country as a whole.

My main interests are Trichoptera and Micro-lepidoptera, and whilst collecting these I have also, since the spring of 1952, collected any specimens of Neuroptera which have come my way. I would emphasise the fact that all my captures were purely by chance. By the end of the year I had taken no less than 22 species.

In the following list, the nomenclature follows that used by Killington in his monograph. All localities are indicated by the name of the nearest town or village, no local names being used, since many of these are incomprehensible to any but the local inhabitants.

CONIOPTERYGIDAE

Conwentzia psociformis Curtis. Brimscombe, 29.viii.52; beaten from holly.

OSMYLIDAE

Osmylus fulvicephalus Scopoli. Sapperton, 2.vi.52; Bisley, 5.vi.52; Birdlip, 29.vi.52.

SISYRIDAE

Sisyrus fuscata Fabricius. Brimscombe, 21.v.52, 16.vi.52.

HEMEROBIIDAE

Micromus variegatus Fabricius. Sapperton, 7.vii.52, 28.vii.52; Brimscombe, 6.ix.52.

Eumicromus paganus Linnaeus. Brimscombe, 15.v.52.

Hemerobius humulinus Linnaeus. Brimscombe, 15.v.52, 21.vii.52; 16.viii.52; Cirencester, 2.viii.52; Sapperton, 20.v.52, 17.viii.52.

Hemerobius stigma Stephens. Brimscombe, 6.ix.52; Painswick, 18.ix.52; Birdlip, 21.xi.52.

Hemerobius atrifrons McLachlan. Sapperton, 17.viii.52; Painswick, 18.ix.52.

Hemerobius nitidulus Fabricius. Sapperton, 10.v.52, 14.viii.52; Brimscombe, 21.vii.52, 6.ix.52; Painswick, 18.ix.52.

Hemerobius micans Olivier. Brimscombe, 16.vi.52; Cirencester, 2.viii.52; Sapperton, 17.viii.52.

Hemerobius lutescens Fabricius. Sapperton, 27.vii.52; Cirencester, 2.viii.52.

Hemerobius marginatus Stephens. Sapperton, 27.vii.52, 19.viii.52; Brimscombe, 28.viii.52.

Kimminsia betulina Strom. Sapperton 20.v.52, 17.viii.52, 20.ix.52; Brimscombe, 16.vi.52.

Kimminsia subnebulosa Stephens. Bisley, 1.vii.52; Brimscombe, 16.vi.52, 21.vii.52; Sapperton, 28.vii.52, 17.viii.52; Painswick, 18.ix.52.

Wesmaelius concinnus Stephens. Bisley, 28.vi.52.

Wesmaelius quadrifasciatus Reuter. Bisley, 28.vi.52; Brimscombe, 21.vii.52; Cirencester, 2.viii.52.

CHRYSOPIDAE

Chrysopa flava Scopoli. Cirencester, 2.viii.52; Brimscombe, 5.viii.52, 7.viii.52.

Chrysopa ciliata Wesmael. Brimscombe, 29.viii.52, at light.

Chrysopa flavifrons Brauer. Cheltenham, 5.viii.52.

Chrysopa albolineata Killington. Brimscombe, 21.vii.52.

Chrysopa carnea Stephens. 28.v.52, 7.viii.52, 6.ix.52, 30.xi.52. These dates are all for Brimscombe, but I have taken the species in many places in the Cotswolds. It appears to be one of the commonest and most widely distributed of the Chrysopids.

Chrysopa perla Linnaeus. Selsley, 28.v.52, very abundant flying in the sunshine; Brimscombe, 16.vi.52.

COLEOPTERA

EARLY APPEARANCE OF CETONIA AURATA L. On 7th April I found a Rose Chafer (*Cetonia aurata* L.) on the public footpath near my house. Is this not an exceptionally early date for this insect? It is not uncommon in Bournemouth and the New Forest, but I have never previously seen one earlier than the end of May: usually in June and July, and once as late as August, when it visited the flowers of a golden-rod in my garden, which does not bloom until that month.—H. SYMES, 52 Lowther Road, Bournemouth. 18.iv.53.

[*C. aurata* becomes an imago in or about August, but does not (or only very rarely) emerge into the open before the following summer. I once came upon a number in late May, flying to hawthorn bloom in the New Forest; and have heard of its occasional appearance in September. Records for April—especially early April like that of Mr. Symes—are, as far as I know, very few. It seems possible that these odd 'unseasonable' individuals may have been stirred into premature activity by some mischance, such as the uprooting of trees or stumps causing exposure or breakage of the pupal cell.—A. A. A.]

DIPTERA

The Hover-flies (*Syrphidae*)

By L. PARMENTER, F.R.E.S.

(Continued from page 159).

FOOD AND FEEDING.

Almost all the species of *Syrphidae* in this country have been seen to visit flowers for nectar or pollen. Many also suck at honey-dew. In *Rhingia* the proboscis is specially adapted, has a knife-like folding action and is elongated. This enables the fly to suck nectar from flowers having long tubes. In many species, such as those of the genus *Eristalis*,

pollen is taken. The grains are crushed and pulped between the plates of the labella. Digestive juices dissolve the pulp so that the fly can suck up the fluid.

This flower visitation causes the flies to be dusted with pollen and undoubtedly the part played by the Hover-flies in the pollination of our plants is immense. They are far more active and numerous than bees in summer and would appear to be of greater benefit to mankind than the more popular bees.

As to the larvae, many feed in stagnant water and in sewage and must be credited with a useful role in assisting in the sweetening of these foul waters. The bulk of Syrphid larvae are eaters of aphides. They destroy an enormous quantity and a large variety of species. Some attack the aphides in the ground, others in galls, and most, those on herbs and trees. Students of aphides have stated their opinion to be that the greatest destructors of aphides are Hover-fly grubs. Thus both adult and larvae are beneficial.

The grubs of *Merodon* and *Eumerus* are the only pests, attacking the bulbs of our gardens. But the adults assist in pollination so that they must not be condemned entirely.

Although various naturalists have given their attention to the flower visiting habits of the adults, little study has been done on the prey selected by the larvae. The control of green fly attacks might be left to the Syrphidae if we only knew the best species to be encouraged. The further study of the predatory habits of these blind grubs would merit the attention of many observers.

ENEMIES.

Of parasites, Dr. O. W. Richards and Miss E. I. Scott bred a number of species and have recorded 9 species of Ichneumonidae: in Chalcidoidea, the Encyrtid—*Syrphophagus aeruginosus* Dalm. and the Pteromalid—*Pachyneuron formosum* Walker and three species of Proctotrupeoidea. Two species of Ichneumonidae that had been oviposited in the eggs of Syrphidae were reared from the pupae. There is obviously a great deal of further breeding of Syrphidae to be done to aid the Hymenopterists in identifying the parasites of these flies and to ascertain their host selection limits.

Of predators, despite the mimicry provided by the black and yellow patterns of the flies, the list is numerous. Several birds have been recorded taking Syrphidae. Swallow nestlings have been found to be fed with several species and when examining, by the kindness of Mr. D. F. Owen, the food of nestling Swifts recently I found such species as *Catabomba pyrastris* L., *Syrphus corollae* F., *Melanostoma mellinum* L., *Syrphus balteatus* Deg., *Eristalis pertinax* Scop., *Platychirus clypeatus* Mg., *Platychirus albimanus* F., *Syrphus vitripennis* Mg., *Syrphus ribesii* L., *Sphaerophoria scripta* L., *Melanostoma scalare* F., *Sphaerophoria menthastris* L., *Eristalis nemorum* L., *Eumerus strigatus* Fln., *Pyrophæna granditarsa* Forster and *Chilosia* sp., in some cases many examples.

In the flies—the Asilidae take their toll. *Melanostoma*, *Rhingia*, *Syritta* and *Syrphus* have provided victims for *Machimus atricapillus* Fln. and *Dioctria rufipes* Deg. has taken *Syritta pipiens* L. The large *Volucella pellucens* L., *Eristalis tenax* L. and *Sericomyia borealis* Fln.

have been captured by *Asilus crabroniformis* L. The dung flies—*Scatophaga stercoraria* L. and others have killed and sucked species of *Platychirus*, *Melanostoma* and *Syrphus*. The Muscid—*Coenosia tigrina* F. has captured a *Platychirus fulviventrís* Macq. Among the Empididae, *Empis tessellata* F. has collected *Chilosia albitarsis* Mg., *Chilosia nebulosa* Verr., *Platychirus peltatus* Mg., *Rhingia campestris* Mg. and *Syrphitta pipiens* L.

Among the wasps—*Clytochrysus* is known to prey especially on Syrphidae and *Mellinus arvensis* L. has captured a *Syrphus*.

As for the spiders there are several that have fed on Syrphidae. *Misumena vatia* Clerck (= *calycina* L.) catches them as they visit the flowers on which it sits. A. H. Turner has seen *Rhingia campestris* Mg. as a victim and Dr. Hobby has recorded this spider taking *Leucozona lucorum* L., *Platychirus peltatus* Mg., *Syrphus ribesii* L., and *Syrphus vitripennis* Mg. In Epping Forest, I found the rarely taken *Cnemodon latitarsis* Egg. as a victim of *Meta segmentata* Clerck.

SLEEP.

There appears to have been little noted about the resting habits of the family. Whereas in some families some species seem to seek the underside of leaves to obtain shelter from the strongest sunshine, few Syrphidae attempt to escape the sun's rays. But as the sun goes in and as the temperature drops, the Hover-flies become sluggish and creep out of sight—down to the base of the herbaceous plants. In the summer, at sundown on warm evenings, I have found *Eristalis arbustorum* L. resting as if asleep on the centres of composite flowers. It has been suggested that the plant may give off some warmth in its growth and the flowerhead may, therefore, be a warm bed.

As for hibernation, occasionally an *Eristalis* or *Syrphus balteatus* Deg. is found indoors in winter and once a *Syrphus balteatus* Deg. was found in an abandoned leather purse in a wood in the depth of winter. But I think these are the exceptions to a rule that Hover-flies do not hibernate as adults. However, there is an old record of 27 *Eristalis tenax* L. that were once found together hibernating in a clay bank in New Zealand.

ATTRACTION TO LIGHT.

Audcent found *Melanostoma mellinum* L. and *Syrphus bifasciatus* F. (= *Epistrophe eligans* Harr.) in a collection of flies taken at a mercury vapour lamp. When examining some thousands of flies from a light trap collection made by Mr. T. Trought I found no Syrphidae. It is, therefore, considered that only odd examples of these diurnal flies are likely to visit lights.

A few Hover-flies have ventured indoors and have been stated to alight on flowered wallpaper. *Eristalis tenax* L. has been found indoors more than once in the autumn and winter and Mr. A. A. Allen found *Volucella inanis* L. indoors. In no case is it thought that the attraction was light.

MIGRATION.

Dr. and Mrs. Lack have recorded *Syrphus balteatus* Deg. flying steadily against the wind through a Pyrenean pass. Other species of *Syrphus* and *Catabomba pyrastris* L. have been claimed as migrants to

this country and Spitsbergen has had immigrants from the continent of Europe. Certainly *Volucella zonaria* Poda would appear to have invaded this country from Europe, colonising the South East corner of England. The suggestion that *Doros conopseus* F. is also a migrant has not found support.

Large numbers of Hover-flies appear at times along the East and South East coasts, sometimes a mass floats in on the tide. In October 1949 and 1950, Dr. G. Bevan found thousands of Syrphidae moving southwards at Spurn Head. Although wind blown flies would naturally endeavour to keep from flying across a sea and try and keep along the edge, taking shelter from sea walls, cliffs, etc., there is sufficient evidence to justify an entomologist paying special attention to these movements. The flies are strong flyers and do not appear in the kite traps sampling the inhabitants of the air at several hundred feet. It is, therefore, likely that all movements could be watched. Those naturalists interested in the migration of birds and butterflies and visitors of the bird observatories in particular might care to note the habits of Hover-flies as well.

ECONOMIC IMPORTANCE.

This has been discussed under the heading of "Food and Feeding" and it perhaps only needs a sentence or two on control measures against *Merodon* and *Eumerus*. In private gardens, the use of soft worthless damaged bulbs as decoys in the vicinity of flowerbeds has been recommended. These bulbs should be destroyed within a month as *Emerus* matures in about six weeks. Wholesale growers should consult Mr. Hodson's studies and recommendations. There is still a need for experimental work on the remedies advocated.

Although pollination is considered generally beneficial, visits of *Eristalis pertinax* Scop., *Eristalis arbustorum* L. and *Syritta pipiens* L. to cucumber flowers in greenhouses have caused these species to be labelled as pests in such circumstances.

NOMENCLATURE.

The aim of the systematist to arrange all the described species into an order showing the presumed evolutionary trend, and his need to obey the rules of priority governing the usage of the names has caused a considerable change in these names during the passage of years. In 1758 Linnaeus described 27 of the species found in Britain, but the first of the present genera of Syrphidae to be described was *Volucella* (described as *Conops* by Poda in 1761) of Geoffroy, 1762, followed by *Rhingia*, by Scopoli in 1763. *Syrphus* itself was not described by Fabricius until 1775. The earlier genera were all described from European material but by 1825 a North American genus had been added. The world-wide distribution of the family has produced many students of the taxonomy of the family and the interesting contributions of Matsuma of Japan and Shannon of the U.S.A. led E. R. Goffe to his years of work on a revision of the family's systematics. The acceptance of some of a number of the new proposals and non-acceptance by others, particularly the 1800 names of Meigen, has caused a variety of names to appear in the literature. It seems probable that the publication of Mr. Coe's keys to the British species will provide a list of names that will be used in this country for many years.

This change of names is always deplored by entomologists concerned with economic and biological studies. Probably the Syrphidae with Muscidae and Tachinidae are the families that have been subjected to most disturbance and most concern the biologist and agricultural entomologist. It must, however, be admitted that as further knowledge is acquired the authors aim at correcting earlier mistakes and at obtaining a proper appreciation of the status of each species. Only time will prove whether stability of nomenclature will be achieved. Fortunately Kloet and Hincks' Check List provides the synonyms to enable the varied names used in economic, systematic and distributional papers to be recognised.

REARING.

Various species of all types of Hover-flies—aphid eaters, inhabitants of rotten wood and of sewage, and even *Volucella* and *Microdon* in wasps' and ants' nests respectively—have been successfully reared. I have reared several species in small collecting tubes, both *Eristalis* and *Syrphus*, etc., from the larval stage to adult. But where more natural conditions are imitated success is far greater. It is hoped that no collector of the Hover-flies will be content until he has bred various species.

STUDIES.

During breeding it is suggested that those with the facilities should keep the various stages as specimens. Hennig has compiled a list of the species so far studied and a perusal of his work will show the vast field still open. Many have possibly bred Syrphidae without properly studying the larval and pupal stages, expecting that the work had already been done efficiently. It must also be remembered that a published record may be based on a single breeding which may be quite abnormal. Rearing in captivity may be different from the results in nature. Confirmation of all results already published is worth while. Any entomologist may stumble on an egg, larva or pupa, unknown in one or more of its early stages. The results should be published with a description of the technique used in rearing to assist others who may wish to try the same method or another.

The literature on the Syrphidae has so many instances of differences in the habits within the same species as to give rise to a number of queries by later students. It is obvious that for any evolution to take place there must be variation, tendencies to change from the normal habit and the normal habitat. But the initial record of abnormality challenges the credulity of readers. There are doubts of identity and of care in observation, in rearing, etc. It must therefore be emphasized that when apparent abnormality is found, it should be recorded as such after careful checking for accuracy of observation and if possible corroboration of identification. But it is not only abnormalities that are to be noted. The normal with its range of variation needs to be placed on record. Although original work is always welcome, attention to previous work of others would ensure progress, confirming facts earlier known and enabling emphasis to be placed on the new facts.

Some dipterists may be more interested in distribution. Besides the county distribution studies, attention paid to habitat factors would be more useful. The distribution of each stage in the lives of each species needs to be known. These facts are worth acquiring, for besides

their own interest there is the use that can be put to them by biologists who wish to know where to obtain their material for their studies and for comparison. Fluctuations in numbers may be great and Laurence and others have drawn attention to the fluctuations in the common species *Rhingia campestris* Mg.

The habits of the family are already known to be very varied but by no means is all known. Individuals in each species vary one with the other, and their study can be most fascinating and far more satisfying than a mere accumulation of dead specimens.

The encouragement in the illustration by line drawings, by colour and photograph now growing in entomology should be extended by the naturalists interested in this family. The colours and shapes of the larvae and adults are worthy of record. A figure will convey more to a beginner than lines of description. The cost of reproduction may be prohibitive in many cases but surely a collection of studies might be commenced by the premier societies and museums.

The Ministry of Agriculture and Fisheries has published excellent illustrations of some of the friends and enemies of man in this family. These should be obtained by all new students of the family.

(To be continued.)

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

WHERE TO GO FOR BUTTERFLIES.—On Thursday, April 9th, at 2.20 p.m., I left London without having seen a single living butterfly of the year. On Saturday, the 11th, at 11 a.m., I found myself under the (scanty) shade of the olives, near Menaggio, watching *Papilio podalirius* toying in mid-air, *P. machaon* skimming over the strips of meadow between the vineyards, *Euchloe cardamines* with its dash of colour, the delicate *Leptidea sinapis* flying over the blossoms in the grass, and the familiar *Pararge megaera* sunning itself with open wings on a hot stone. After dull winter days this was a delightful experience. I remained in Menaggio till April 20th, and, during those few days, noted about thirty species of Rhopalocera. *P. podalirius* was very common and especially attracted to the upper branches of the plum trees around the town, then in blossom.—ALFRED SICH.

SCARCITY OF INSECTS AT SUGAR IN 1902.—My experience last season was that flowers were the more attractive bait, as I think the following will show. In July last I sugared in Parkhurst Forest, Newport, Isle of Wight, and was not at all satisfied with the few insects which were on the sugar, nor with the way *Thyatira batis* and *Gonophora derasa* kept flitting past my lantern, only occasionally settling, so I turned my attention to the flowers of the bramble, and found *T. batis*, *G. derasa*, *G. libatrix*, *H. oleracea*, *C. affinis*, *C. trapezina* and many other moths there in goodly numbers. On July 24th I sugared some posts at the edge of the cliffs on the way to Beachy Head, with very poor result . . . and concluded that the flowers up the face of the cliff were getting the lion's share of the visitors, as a number of moths flitted up towards the lantern light and returned down the cliff as quickly as they came. I, therefore, resolved to visit some privet bushes which I had noted on my

way up, and which were in flower. As soon as I got to them my conjecture was confirmed, as the buzzing wings was quite noticeable, and I found that the bushes were alive with moths jostling one another, and barely a flowerhead but had one or two moths.—C. W. COLTHRUP.

LEUCOMA SALICIS FLYING AT DAWN.—Having occasion one morning last July to get out of bed at dawn, to scatter some members of the feline tribe from the vicinity of my bedroom window, I was agreeably surprised to see a number of *L. salicis* flying about, which fully compensated me for the interruption to my innocent slumbers.—C. W. COLTHRUP.

Current Literature

CATALOGUS DER NEDERLANDSE MACROLEPIDOPTERA. By B. J. Lempke. Pars XI.

This, the final part of the Catalogue of Dutch Macrolepidoptera published as a supplement to the *Tijdschrift voor Entomologie*, 1952, 95: 197-319, has just been received. It deals with the rest of the Geometrinae and as in the earlier Parts the subspecies and aberrations found in the Netherlands are described with references to the original descriptions, and a number of new subspecies and aberrations described and named by the author are given. Since many of these occur in the British Isles this catalogue is indispensable to any British lepidopterist who is interested in variation. There is also an index to the whole of the Catalogue. In this Part there is also a supplementary list of species discovered in the Netherlands since the Catalogue was started, and a short history of the Dutch fauna with a list of species which are or were indigenous in that country but not in the British Isles.

A useful addition is a list of Schiffermüller's names for the Agrotidae and Geometridae dealt with in Parts IV (1939) to X (1951) which are *nomina nuda*, with the valid names which must replace them. Fortunately most of the changes involve a mere change of authorship, but in other cases there is no valid name available or a name known to everyone would be replaced by one which has seldom or never been used. Lempke recommends that these should be placed on the Official List of Specific Names in Zoology. Opinions will differ about the desirability of this, though most will agree that when there is no valid name available this is the best course to adopt.

E. A. C.

FIRST SUPPLEMENT TO THE INDEXED CHECK-LIST OF THE BRITISH LEPIDOPTERA WITH THE ENGLISH NAMES OF THE 2313 SPECIES (1947). By I. R. P. Heslop, M.A., F.R.E.S. Published by E. W. Classey. Price 1s. 6d.

Since the original check-list was published to the end of 1951 38 species have been added. These are included and the typographical errors are corrected. The new *Colias* is called *australis* Verity and it is to be hoped that this will be altered to *calida* when the List is amended. It has not been proved conclusively that the new British species of *Eupithecia* is *alliaris* Staud. The bursa copulatrix of the only known specimen, that from the Isle of Man, agrees with Petersen's figure of

the bursa of *alliaris*, but is it certain that no other European species has a similar bursa?

E. A. C.

THE 39TH-49TH PROCEEDINGS AND TRANSACTIONS OF THE MANCHESTER ENTOMOLOGICAL SOCIETY, 1941-51. Published by the Society, April 1953. Price 10s. 6d.

This 44-page report brings the Society's publications up to date and comprises a number of short papers by members. These are mainly about the insect fauna of the district, including the social wasps of the Manchester area, the Plecoptera, Ephemeroptera and Odonata of N.E. Lancashire, the Tipulidae (with special reference to the Oldham district), and the Microlepidoptera of the Wilmslow Mosses. There is also a paper on the insects associated with *Typha latifolia* and 65 species of beetles are listed which have been obtained from this plant in winter by stripping the sheaving leaves from the stems. In another paper four dipterous and four hymenopterous parasites of the moth, *Deilephila elpenor*, are described and a key is provided for their identification.

D. F. O.

The 5th Annual Report of the Huntingdonshire Fauna and Flora Society contains the first part of the "Lepidoptera of Huntingdonshire" by J. E. H. Blackie. This deals only with the Lycaenidae. The old records of *Lysandra bellargus*, *Cupido minimus* and *Plebejus argus* are considered doubtful, as suitable habitats are not to be found within the county. *Polyommatus icarus* is thought to have decreased recently as a result of ploughing. The introduced *Lycaena dispar batavus* survives at Wood Walton and all five of the British hairstreaks seem established in good numbers. As there is no "Lepidoptera of Huntingdonshire" this paper is a welcome start to the county list.

D. F. O.

In *The Naturalist*, No. 845, April-June 1953, there is a paper by K. G. Spencer entitled "Abnormal abundance of the larvae of the Antler moth in the E. Lancs.-W. Yorks. Region, 1947 and 1948, and the effect upon the bird life of the area". Plagues of larvae were found on the moors in these two summers and were discovered and eaten by black-headed gulls, lesser black-backed gulls, rooks, jackdaws and starlings. It is noted that the main plague in 1947 followed a hard winter as did a previous plague in the area.

D. F. O.

In the *Irish Naturalists' Journal*, Vol. 11, April 1953, there is a summary of the records of migrant insects in Ireland in 1952 by E. S. A. Baynes. *Pieris brassicae* was seen going north-east at the Great Saltee in the first half of August and as elsewhere *Vanessa cardui* was very early in its appearance and very abundant in Ireland. A swarm of *Callimorpha jacobaeae* which appeared at the Inishowen Lighthouse, Co. Donegal, was thought to be of migrants. In a short note the same author records the second occurrence of *Polychrisia moneta* for Ireland (the first record was in 1939). A moth and an empty cocoon were found and the author concludes that the species is now probably established in Ireland. There is also a short paper by R. F. Haynes on collecting lepidoptera at Connemara and N. Mayo in June 1952.

D. F. O.

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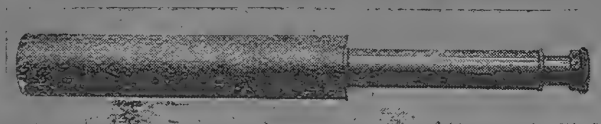
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Urgently required during the next few months for research purposes, pupae of *Biston betularia* Linn. (melanic or otherwise). Would be most grateful if entomologists would inform me of approximate percentages of the two melanic aberrations—*carbonaria* and *insularia* and the typical, occurring in any locality.—Dr. H. B. D. Kettlewell, Department of Zoology, University Museum, Oxford.

Wanted.—Butterflies of Europe, America, India and Africa in exchange for Butterflies of Malta.—G. G. Lanfranco, 3 New Str., Sliema, Malta, G.C.

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MACDONALD

Lectotypes of one Subspecies and Two Aberrations of British Geometridae

By E. A. COCKAYNE, D.M., F.R.C.P.

Sterrha ochrata Scopoli ssp. *cantiata* Prout.

I have selected a specimen labelled "Deal, 11.vii.1908. L. B. Prout" as the lectotype.

Ectropis consonaria Hübner ab. *nigra* Banks.

I have selected a male labelled "Kent, bred 1904. E. Goodwin" as the lectotype. I wrote to the curator of the Maidstone Museum and was informed that the type is not in the Goodwin coll. No type was marked in the Banks coll.

Cleora rhomboidaria Schiffermüller ab. *nigra* Adkin.

The melanic form of this species first found in England at Norwich and later in N. Kent is usually referred to as ab. *rebeli* Aigner-Abafi. Aigner's original description in Hungarian (*Rovart. Lap.*, 1905, 12: 152) and published by him again in German (*Ent. Z.*, 1906, 19: 209) says that *rebeli* is rust-black with a zigzag white subterminal line. In all the British specimens I have seen the subterminal line is absent or consists of a series of pale yellow interneural loops, but as a rule the basal and median areas are bordered by more definite pale yellow lines, and in the most distinctly marked yellow may invade the median area itself.

Aigner's description agrees with one of the melanic forms of *C. repandata* and I think he was describing a parallel form of *rhomboidaria*, genetically distinct from the British, French, and Austrian melanic forms. This was named ab. *nigra* Adkin (*Proc. S. Lond. ent. Nat. Hist. Soc.*, 1908-1909, 85, published in 1909). *Nigerrima* Moreau (*Bull. Soc. ent. Fr.*, 1916, 188, Pl. i) is a synonym. Lenek (*Nachrblatt Oesterr. u. Schweiz. ent.*, 1951, 3: 122) has subdivided *nigra*, calling the completely black form *orcus* and the one most variegated with yellow *exquisita*, but the melanism in all is determined by the same main gene. *Rebeli* has been used by British entomologists for many years and both H. B. Williams and E. B. Ford writing on the genetics do so. In Seitz a specimen of *nigra* is figured as *rebeli* and the description is not Aigner's but is based on a *nigra*. Adkin did not mark his type and I am making a female labelled "Dartford, 12.viii.1908" the lectotype of ab. *nigra*. There are only two specimens in his collection which by their labels could be those Adkin had before him when he gave the name. He bred large numbers later and published the results of his breeding experiments (*Proc. Ent. Soc. Lond.*, 1915, cxxii), which proved that the form is dominant and that the heterozygote and the homozygote are indistinguishable.

A Subspecies of *Plusia gamma* Linnaeus

By E. A. COCKAYNE, D.M., F.R.C.P.

In 1899 I spent the 27th August at Sheerness, where I found ten larvae of *Plusia gamma* L. on *Atriplex*, which was growing luxuriantly along the shore. All had a black stripe on each side of the head, and

black legs. They were heavily pigmented, some nearly black, with distinct longitudinal stripes, and though they appeared to be nearly full grown they were very small. They spun cocoons between 30th August and 2nd September, and the moths emerged between 14th and 21st September. The moths were very small, pale, and silvery, with none of the rich purplish or brown colour of normal *gamma*. I intended to blow one of the blackest, but was too late and had to blow the most backward, which happened to be the lightest. According to my diary five moths were bred from nine larvae, but there is no mention of the fate of the other four. A long time after I examined the genitalia, which agreed with those of *gamma*.

Many years later I found a note by G. T. Porritt (*Ent. mon. Mag.*, 1892, 28: 255) entitled "Notes on a probably hitherto undescribed form of the larva of *Plusia gamma*". He says that in the middle of July Mr. Charles Whitehead of Maidstone sent three larvae, saying they were abundant on clover, nettles, thistle, etc., and three days later, 18th July, he sent five more. Though still quite small they began to spin up and produced pupae little more than a third the size of *gamma*. From his larvae Porritt bred only one moth, but Whitehead sent him three more, and all were less than half the size of *gamma* caught a fortnight before on the Lancashire coast, and they were uniformly paler and more silvery and were without the purple tint of the Lancashire specimens and of all the others in his cabinet. More than half his larvae died without spinning and Whitehead says that many of his cocoons were imperfect and came to nothing. He ends his note with a long and careful description of the larvae, which were about an inch long, very dark olive green, in one specimen nearly black, with green longitudinal stripes. The head and legs (he makes a slip and says prolegs) intensely black and shining, the tubercles black and distinct each emitting a short stiff grey hair, and the prolegs having on the outsides a large cup-shaped black mark.

J. C. Miller (*Ent. mon. Mag.*, 1892, 28: 287) says that on 6th-14th July 1892 his son found young larvae of *gamma* on *Matricaria*. These when grown up were like Porritt's in appearance, and were very small, and they produced three very diminutive pale silvery moths from 16th August onwards. The other larvae though well fed died. Miller's larvae were found at Beckenham, Kent.

The uniformly small size of these larvae found on different food-plants, and at different places and times, cannot have been caused by shortage of food, unsuitable food, or very dry food. Those I found were eating the fleshy leaves of *Atriplex*, which was growing in great abundance and was very juicy. Their dark colour cannot have been a response to the prevailing colour of the foodplants, which were very varied. C. B. Williams has shown that overcrowding makes the green of *Plusia gamma* darker, but my larvae were thinly spread over a long stretch of *Atriplex*, and it showed no signs that it had been eaten by a large number of earlier larvae. Thus there is no obvious reason for the abnormally dark coloration or the abnormally small size of these larvae. There is, however, evidence that they were unusually delicate.

A very large number of very small *gamma*, producing pale silvery moths, was recorded one year in Belgium, and the form was named *ab. minuscula* by Lambillion (*Cat. Léop. Belge.*, 1904, p. 144).

It is well known that in some years large immigrations of *gamma* take place in Kent consisting of moths all of which are small, pale, and worn. I witnessed one myself in the Warren at Folkestone in July 1946. The explanation often given is that they came from an area where the foodplants were unusually dry and lacking in nutritive value or that the number of larvae had been so great that they had been starved. This explanation is inadequate in the case of the British and Belgian larvae and it appears probable that their small size is genetic and not environmental and that they belong to a subspecies, the larva of which tends to be unusually dark and the moth small, pale, and silvery. Can this be ssp. *gammima* Staudinger (*Cat.*, edition 2, 1901, p. 238)? Staudinger describes it as "duplo minor; al. ant. magis signatis", half the usual size with very strongly marked forewings, and says Syria and Pontus are its homes. The description agrees quite well and one would expect a subspecies from the eastern Mediterranean to land in Kent. *Ab. minuscula* Lambillion is later than ssp. *gammima* and is inappropriate, because the form is a subspecies not an aberration. I should like to know more about *gammima* and what sort of larvae and moths are bred from the small immigrants.

Vapourer Group Adaptations and the apterous state, with reference to a South African species in which the young larvae eat the living parent

By H. B. D. KETTLEWELL, M.A., M.B.

In *The Entomologist's Record* for December last (1), under the heading ' Fifty years ago ', the interesting observations of Dr. T. A. Chapman on the ' Pairing of the ' Vapourer ' moths ' are quoted from the 1902 issue. He points out the habit differences between *Orgyia antiqua*, *O. recens* (*gonostigma*) and *O. splendida*. Even within *O. antiqua* there may be modifications of habit. Cockayne (2) quotes Pictet (3) as saying that in Switzerland *Orgyia antiqua* produces two kinds of female, a small one, which must be fertilized and gives both male and female offspring, and a large one with different habits, which is parthenogenetic. Both kinds of female are said to occur in the same brood, and in one case the sexes were equal in number, but there were about twice as many parthenogenetic females as ordinary ones. When one considers that the spread of this genus, where the females are apterous and where the male cannot carry her during copulation, must be dependent on larval activity only, it is surprising they have so widespread a distribution. Selection for the apterous state may at times have an obvious advantage, for instance it appears to be found more frequently in species which live on small islands in turbulent climates (*e.g.* Tristan da Cunha). Flight in these windswept areas is full of hazards. H. B. Williams has shown in *Rhodometra sacraria* that a partial apterous state in both sexes may be under the control of a single pair of allelomorphs and inherited as a simple recessive (4). Furthermore the vestigial state may confer benefits under the control of the same gene. W. P. Spencer (1932) (5) showed that even though the wingless mutant of *Drosophila melanogaster* is at a disad-

vantage in a normal environment, it is longer lived in the absence of moisture and in drought conditions.

A compromise has been reached in *Orgyia thyellina* which occurs in Japan. The females are dimorphic, one form being apterous, the other having large and effective wings (6, 7). I am grateful to C. L. Collenette of the British Museum for calling my attention to this state of affairs, one which I do not know in any other Macrolepidoptera, but it is similar to the dimorphic females of *Acentropus niveus* Oliv. in the Pyralidae where the apterous form is adapted for living underwater whilst the normal winged state is attained by others.

In 1950 I sent Mr. Collenette all the Lymantriidae I had collected in various parts of Africa and amongst these was a series of fifteen males of a 'Vapourer-like' moth taken on the Cape Peninsula. He identified these as *Bracharoa dregei* Herr.-Sch., and added the remark 'female unknown, probably wingless'. In 1951 I took a 'Vapourer' larva near the summit of the Glencairn Mountains, Cape Peninsula. It was feeding on an *Erica* species and pupated in due course. The next observation I have is that some weeks later I found the cocoon full of infertile eggs. The dead and completely apterous female was also in the cocoon. I suspected correctly that this was the female *dregei*. On the 27th December, 1952, my attention was attracted to larvae of this same species feeding in numbers on a bush of climbing *Geranium* on a wall and they were found to be dimorphic. Of a total of 215 collected between this date and January 10th, 123 had bright crimson humps on segments 8 and 9 (head number 1), and 70 pale yellow, 18 of the crimson having been an intermediate orange in their third instar but subsequently turned crimson. It was noted that the further one collected larvae from their breeding centre (the *Geranium* bush) the higher the percentage of yellow ones occurred. Differential counts were undertaken at the centre and at a distance of 18 feet from this on the following dates, December 27th, January 6th and 10th, and a collection of larvae made, a summary of which is given below:—

Counts. Date.	Centre.		Over 18 feet from centre.	
	Crimson.	Pale Yellow.	Crimson.	Pale Yellow.
Dec. 27th	96	34	1	11
Jan. 6th	11	7	7	14
Jan. 10th	3	2	5	24
	—	—	—	—
Total	110	43	13	49

This gives the highly significant result of 28.1% yellow at the centre and 79% at 18 feet distant. It may be added that two larvae taken over 20 yards distant were both yellow. It therefore appears that increased activity may be linked with the yellow form, an important point of survival value for a species whose dispersal (in the female) must be undertaken entirely in the larval stage. Much more work must be done on this, however, before these results can be accepted as definite.

On the other hand it was found that in the presence of damp and bad feeding the 'yellows' are less viable than the 'crimson'. In the brood subsequently mentioned 20 'yellow' and 61 'crimson' were isolated in a container and subjected to damp food which was changed

every fourth day. After ten days of this treatment 12 crimson and 1 yellow remained. The control was unaffected.

Breeding experiments to elucidate the genetics were hampered by continual invasions of the Argentine ant and also virus disease in the late summer, which carried off whole broods and only one earlier brood from a wild cocoon containing eggs, collected on January 6th, is worth mention. 162 larvae were bred of which 40 had yellow and 122 had crimson humps. This is suggestive that the 'yellow' are recessive to the 'crimson'. Pairings of crimson \times crimson, yellow \times yellow were all destroyed at an early stage by the ants. There was no sign of any total sex linkage. 32 'yellows' produced 21 males and 11 females, and 55 'crimsoms' 40 males and 15 females, the deficiency of females being caused most likely by the late larvae having been killed off by a virus disease. The female larvae are much bigger and take longer to feed up than the males but they appear to have a shorter pupal period.

The apterous female has all its appendages completely atrophied or absent. There are no signs of wings externally and the legs under a lens appear like the larva's three pairs of thoracic legs. Behind the head she has a chitinous modification of her thoracic tufts which may well be used for helping the males to gain access to the interior of the cocoon. The males assemble freely in daylight from early morning to late afternoon. After a moment or two of hesitation on the outside of the cocoon, he pushes his way in, disappearing altogether, but unlike *O. splendida* reappears again in about two hours. Oviposition commences within the cocoon soon after and on opening this at a later date the still-living female, now like an empty bag, is found lying up against her egg mass. She continues to remain alive until the young larvae hatch. Originally I could not imagine what happened to her then as she always disappeared. I have since established that, strange as it seems, the young larvae feed on, and entirely eat up their living parent! Gifts of other living females are gratefully accepted only if ovipositing has been completed and they do not relish females full of eggs. It is therefore not surprising that the 'female is unknown' at the British Museum! One supposes that this is yet another provision against drought and under the very dry conditions which usually prevail when this species is breeding rapidly one may think that matricide is indeed excusable!

REFERENCES.

1. *Ent. Rec.*, 1952, **64**: 12, 361.
2. Cockayne, 1938, *Biol. Reviews*, **13**, p. 128.
3. Pictet, A., 1924, *Bull. Soc. Lepid. Geneve*, **5**, 107.
4. Williams, H. B., 1950, *Ent. Gazette*, **1**, p. 109.
5. Spencer, W. P., *Amer. Nat.*, **66**: 474-8.
6. Wöhlrig, *Int. Ent. Zeit.*, XXI, p. 36 (127).
7. *Ent. Zeit.*, 1915, **29**, p. 9.

The Handling of 'Papered' Insects.

By D. G. SEVASTOPULO, F.R.E.S.

Re-reading past accounts of collecting trips on the Continent, I have been struck by the apparent neglect of the technique of "papering" by British collectors abroad. Collector after collector, in article after article, lays stress on the loss of time occupied by setting, on the need for

space, and on the risk of damage in transit, yet not one appears to have adopted the alternative of papering his captures and setting at his leisure after his return. I am not suggesting that a relaxed insect is as easy or pleasant to set as a fresh one, but I know that I would far prefer the minor disadvantage of setting relaxed specimens to the major ones that setting abroad and transporting set specimens involve.

As my work takes me permanently to the Tropics, I usually accumulate several thousand specimens, ranging in size from small Pyralids to large Saturniids, between furloughs and an account of my methods may be of interest.

To start from the beginning, the paper used for the "papers" should not be glazed, nor should it be too rough in surface; it should not be too thin and flimsy, or it will not retain its folds, and it should not be too stiff and thick, or the pressure will flatten the bodies of the insects. I have found medium-weight typewriting paper a very suitable quality. The papers themselves should be made in definite sizes, and I prefer to have the long side of each size double the length of the short side of the next smaller size. This makes for neatness and saves space when it comes to packing. I use rectangles of $5 \times 3\frac{1}{2}$, $4 \times 2\frac{1}{2}$, $2\frac{1}{2} \times 1\frac{3}{4}$, and $2 \times 1\frac{1}{4}$ inches respectively for my four standard sizes. These can be made conveniently by cutting a quarto size sheet into four, eight, sixteen or thirty-two pieces, the largest (first) and third sizes requiring a slight trimming along the long side of the slip. The method of folding is too well known to require description.

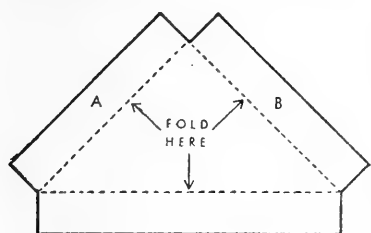
Specimens should be papered with the wings folded over the back, the under surface outwards, and with the antennae placed between the wings. The position of the insect in the paper should be with the costal edge of the wings along the long fold. It is most important, to my mind, to use the smallest possible paper and never to put more than one specimen in each. A small insect in a large paper is apt to slide about and rub itself, and the same happens if more than one specimen are put in one paper. Full data should be written on the paper in ordinary lead pencil, not in ink or in copying pencil as this is troublesome when the time comes for relaxing.

The filled papers are best stored in a wooden or cardboard box until they are completely dry, a little naphthalene keeping off insect pests and a few thymol crystals keeping off mildew. A closed tin is not a suitable container for freshly caught, papered insects as the bodies are apt to decompose.

When the insects are perfectly dry, they should be packed for transit. Piele, in his book *A Guide to Collecting Butterflies of India*, figures and describes a very ingenious triangular cardboard packet, which I have found most useful. His design, however, is rather complicated, and a similar packet can be made much more simply. I take a piece of cardboard—the cardboard from cartons containing the various breakfast cereals is very suitable—and outline two triangles of the size of the papers to be packed. An inch wide flap is then provided on each of the three sides and the whole is cut out. The figure below will show what it looks like.

The flaps are then folded along the dotted lines and the two cut and folded pieces of card are pasted together by the two short flaps A and B, the finished result being a small triangular box, exactly the size of

the papers it is to contain and one inch in depth. When dealing with large numbers of insects it will be found easier to cut outline stencils out of thicker card or celluloid, and use these for making the outline drawings of the packets themselves.



When the paste is dry, the papers can be packed in the packet. It is advisable to place them so that the abdomina are alternately to the left and right, this makes for evenness of pressure, and it is better to keep insects with thick and slender bodies in different packets. If thick-bodied moths and slender-bodied butterflies are packed in the same packet,

the pressure is uneven and there is liable to be breakage. When the packet is full, the long flaps in front can either be fastened by a strip of gummed paper or tied round with a strand of wool. It is a good plan to number the individual packets and to keep a list of the contents of each: this saves time if a particular specimen is wanted later.

The packets can then be packed in tins for transit by post or in baggage. It is here that the advantage of exact sizes will be realised as it means a great saving in space. A little naphthaline and thymol should be added to discourage insect pests and mildew. The tins are best closed with a piece of insulating tape round the lid to exclude damp, or, if the risk of damp is greater, soldered up. In this latter case one end of the tin, which should be clearly marked, must be filled with crumpled paper, not with packets of specimens, so that it can be opened with a tin opener without risk of damage.

My method of relaxing is unorthodox, but both quick and successful. The insects, in their papers, are placed in an ordinary zinc relaxing tin, in which the cork carpet covering the bottom has been raised half an inch on strips of wood. When the box is full, a spoonful of methylated spirit is poured over the papers and the box is closed for forty-eight hours. The amount of spirit varies, naturally, with the number of insects to be relaxed, but the aim should be to ensure that the papers are just damp, not sodden, with the spirit when the box is opened forty-eight hours later. Setting is done in the normal way and the insects will be found to be perfectly dry and stiff after forty-eight hours on the setting boards.

In an old note on the use of methylated spirit for relaxing (1929, *Entomologist* 62: 284) I stated that it could not be used for blue *Lycaenids* as it discoloured them. I have since found that this is incorrect: an occasional specimen is discoloured, but this is due, apparently, to grease, and the discoloration is easily removed by a petrol bath.

Kampala, 8.iv.53.

The Hibernation of *Plusia festucae* Linn.

By AN OLD MOTH-HUNTER.

Can any reader of this journal tell me whether *Plusia festucae* hibernates in the egg or the larval or the pupal stage and, if in the larval or pupal stage, where? None of my friends and correspondents

can answer my comprehensive question from personal experience; one and all they refer me to the books—which, as often as not, are wrong or contradictory. In this case a search of the books has merely confused me. Here is what the 'authorities' say—and by 'authorities' I mean those lepidopterists whose works are customarily referred to as 'text-books'.

Barrett (*Lep. Br. Is.*, 6: 114) evades the subject. Tutt (*Practical Hints*, II:128) remarks "The larvae of *Plusia festucae* hibernate when very young, and begin to feed again in April" Since the imago flies in June, and many collectors have taken it again in August, it would seem that Tutt's words "when very young" indicate that the larvae which hibernate are the progeny of a normal second brood. But unhappily in the next volume of the same work (III: 38) Tutt classes *festucae* as one of those species "which are naturally single-brooded, but which produce a partial double brood occasionally, or even frequently". Barrett also (*op. cit. ibidem*) says "On the wing in June and July, and as a second generation in August and September. This, however, appears only to have been observed locally, more especially in Cheshire, and in Scotland and Ireland, and probably depends in some degree upon the season". But if the second brood "depends . . . upon the season", in what stage does the insect hibernate *normally*?

Barrett's mention of Cheshire seems to indicate that he had in mind an article by J. Arkle of Chester in *Entomologist*, 29: 113 (April 1896) wherein Arkle relates that on 6th June he "found a larva spinning up" and on 13th June "took six pupae". The moths from all these pupae emerged on 29th June, 1st July and 5th July. Arkle then went on to say that "the second brood this year had spun up by Aug. 18th, when I found three cocoons On the 24th I found three more cocoons On the 27th I found two pupae, and a caterpillar in the act of spinning its cocoon". In 1895 the last imago from pupae collected by Arkle in August emerged on 7th September.

Arkle then quoted a correspondent who told him that at Bolton, Lancashire, "the half-grown larvae are found in April, and full-grown larvae up to the middle of June". Another correspondent related that "in forward seasons" he had found the chrysalis by 18th May, but never earlier. "It is in the chrysalis state about four or five weeks, and I believe the young larvae hibernate". Arkle ended by expressing the opinion that either there is a second brood or "the progeny of the *only* brood (June-July) . . . hibernate as eggs or larvae".

Clearly, then, in Arkle's experience the winter of 1894 at Chester was passed by *festucae* in the egg or larval stage; but Newman & Leeds (*Text Book of Brit. Butt. and Moths*, 1913, p. 62) state that it is the larval stage in which the species *normally* hibernates and note that it is "usually single brooded North imago July". If this last assertion be correct the egg stage must be of several months duration, the eggs laid at the end of June hatching, presumably, in September or October. Merrin (*Lepid. Cal.*, 2nd ed., 1875, p. 235) states that the larvae are to be found in May-June, July, August; pupae in June, and imago in August.

In France and Belgium, according to Lhomme (*Cat. des Lép. de France et de Belgique*, I: 317, No. 857) the moth flies from June to September and the larvae are to be found only in May and June! Berge

(*Schmetterlingsbuch*), however, states briefly that the larva feeds "from September to May", which indicates that in Germany at all events *festucae* hibernates as a second brood larva. Newman (*Illus. Nat. Hist. Br. Moths*, p. 453), on the other hand tells us that the larva feeds in May and June "and is full-fed at the beginning of August, when it spins a whitish cocoon among the leaves of grasses and changes to a green chrysalis"; so he was of opinion that the insect hibernates in the pupal stage. Westwood (*Br. Moths and their Trans.*, 1841, p. 234) says that the moth appears "in June and August. It is not a very rare species, occurring in the marshes round London, as well as in the meres of Hunts. and Cambs.", so he was of opinion that the August brood was a normal one and not confined to Cheshire.

In spite of this confusion in the books I find it difficult to believe that no lepidopterist has ever bred *Plusia festucae* through the winter in captivity and recorded his observations; but such record, if it exists, has successfully eluded me. Surely there must be readers of this magazine who can enlighten me. A request for information on the subject printed in the *Entomologist* in 1948 (81: 101) did not elicit any reply.

So I ask again: Where, and in what stage, does this species hibernate?

Further Experiences in Breeding Varieties of *Panaxia dominula* Linn

By H. SYMES.

Towards the end of a previous paper on this subject (*Ent. Rec.* 65: 67) I mentioned that a vigorous brood of larvae had resulted from a pairing between two *ab.bimacula* and that 164 larvae had gone into hibernation last autumn.

They came through the winter extremely well, with only seven casualties. Once before, in the winter of 1941-2, over 90% of my hibernating larvae survived, but in other years only a small percentage did so. I have been looking for possible reasons for success or failure in this matter and think that there may be three of these: (1) climatic conditions during the winter, (2) nature of receptacle used for housing the larvae during hibernation, (3) comparative healthiness of the broods of larvae. This last point can hardly be assessed except by results. But as regards the first point, 1941-2 and 1952-3 were both cold winters, whereas 1948-9, 1950-1, and 1951-2 were mild, damp winters, and in each of these there were very heavy losses. Only 22% survived in 1952, and although I have not exact records for the other two mild winters I think the percentage of survivors was even lower. As for the second point, the larvae in 1941-2 and 1952-3 were kept in similar receptacles. In each case 50 or 60 were kept outdoors in a muslin sleeve erected like a tent over a 9-in. flowerpot full of earth in which cut stems of hemp agrimony (*Eupatorium cannabinum* L.) were inserted: most of the larvae spent the winter in curled-up dry leaves. The muslin tent was supported by a stick firmly driven into the earth in the pot. Early in 1942 this contraption was buried in snow for several days. The other half of my 1941-2 larvae was kept in a glass cylinder fitted to an earthenware pan with a perforated zinc lid. This is described as "Young's cage" in Tutt's *Practical Hints*, II, p. 82.

The rest of my 1952-3 larvae was divided into small batches of 20-30 and placed in small muslin bags, each tied at the base round a twig of *Prunus* or *Salix* with dry leaves attached to it or loose in the sleeve. These bags were placed inside the open window of a garden shed, facing east, with the supporting stem of *Prunus* or *Salix* inserted in an old ink bottle. In other years some of the larvae were kept in ordinary wooden breeding-cages, and I have come to the conclusion that these are not good receptacles for *dominula* larvae during hibernation.

Of the 157 larvae that survived the winter about 20 died during the spring, and another 20 I gave away. A few were accidentally killed, a few failed to pupate, and eventually 73 moths emerged, the first on 29th May, the last on 12th June. Every one of these was ab. *bimacula*. There was the usual variation in the number of spots at the apex of the forewings: they were always small in size and in four or five moths were entirely absent. There appeared to be no variation in the markings of the hindwings or in the amount of black on the upper surface of the abdomen.

Dr. H. King tells me that *bimacula* \times *bimacula* would be expected to yield nothing but *bimacula*, so there does not appear to be much prospect of any fresh mutation appearing in this strain, the history of which may be summarized as follows:—

1950. From 29 larvae collected near Abingdon, one ab. *medionigra* ♂ was bred. This paired with a type *dominula* ♀ of the same race.

1951. F¹. Of 17 moths, 9 were type and 8 ab. *medionigra*. Pairings were obtained between *medionigra* ♂♂ and ♀♀.

1952. F². Of 54 moths, 23 were ab. *bimacula*: a pairing was obtained between two of these.

1953. F³. Of 73 moths, 100% were *bimacula*.

These bred moths emerge too early in the year to mate with wild *dominula*, but I have obtained pairings between—

(1) *bimacula* ♂ and ♀.

(2) *bimacula* ♂ and a ♀ bred from eggs laid by a ♀ taken at Kingsdown, Kent, in 1952.

(3) *bimacula* ♂ and a ♀ bred from larvae collected at Ringwood, Hants, by the Rev. F. M. B. Carr in 1953.

In each case eggs have been laid, and I hope these cross pairings may produce something interesting.

Memories of the Years

By KENNETH J. HAYWARD.

In a corner of my laboratory stands an old kite net. More than half a century has passed since that morning I unwrapped the parcel in which it came, and since that day it has been my constant companion in many parts of the world. It is a tribute to British workmanship, for through all those years it has but twice required attention and on both occasions the fault was mine, when more than thirty years ago on the slopes of Mount Troödos I fell and broke the Y, which, however, was so well soldered by an itinerant Turkish tinker whom I shortly afterwards encountered at his roadside camp that it has never since shown any signs of weakness, and more recently in the forests of

Misiones when it became necessary to replace one of the canes with a piece of local hardwood after I had for some time been using the net for sweeping, which is not a kite net's job.

Constant assembling and dismantling has worn the ferrules so that they must now be packed with paper, but otherwise, except for the replaced cane, the frame remains as it was when it left the makers. I would not care to guess how many bags have come and gone, for tropical forest and thorny scrub play havoc with the thin fabric and there was even one that was eaten into lacework by a small swarm of locust-hoppers.

Sometimes as I sit resting for a moment in those last minutes of late evening when the day's work has been put aside, and I see the old net, my thoughts go back over the years——

Schooldays at Bruton when every free minute was spent collecting; Cogley wood with its fritillaries and *valesina*; the almost black Comma I saw and missed and later found again; the scent of privet at the Cogley gate where the white-letter hairstreaks flew; Vanessids on the purple scabious that filled the fields around the wood, and the colony of marsh fritillaries in the damp meadow below the ruined keeper's cottage, a colony now lost through war-time ploughing. Evenings spent dusking in lanes where the scent of flowers lay heavy and the air was redolent with the perfume of honeysuckle. Stourton woods and the quarry on Creech Hill in which even yet the chalk-hill blue maintains a precarious foothold and where I once caught *syngrapha*. Swanage and Lulworth Cove and the forests of Exmoor; occasional visits to the New Forest and summer holidays amongst the combes and lanes and along the cliffs of Devon and Cornwall, followed by first working days in Anglesea and North Wales; and then in Southern Egypt. Moments snatched from war by Macedonian roadsides or along the foothills of the mountains where amongst the flowers lay relics of past conflicts. An autumn in Malta and an English spring and summer revisiting old haunts, and once again to Southern Egypt with its cloudless skies and interminable sunshine; searching for blues amongst the sparse stunted vegetation of the islands near Aswân; the hum of insects round mimosa the fragrance of whose flowers was everywhere; the clouded yellows swarming over the alfalfa till the plots seemed filled with buttercups; the afternoon when I caught a *Hypolimnas misippus*, vagrant from the far Sudan, and another when out of the blue vault of heaven a dead fox crashed to earth beside me, dropped by some passing bird of prey; the Oleander hawk moths whose caterpillars left our hedges bare of leaves, and my first contact with the long-tailed blue.

Occasional visits to Cairo and collecting around Maadi, then but a few houses scattered amongst the cultivated fields, and odd hours spent in Mediterranean ports of call as I wandered homewards for the annual leaves. Two visits to Cyprus where the mountain air was heavy with the fragrance of the pines in whose shade *Satyrus hermione* flitted and where in small glades the *pandora* fritillary floated lazily or sometimes a passing *cleopatra* brimstone, to turn my thoughts to the *paphia* in Cogley wood and to England in springtime. Here on Mount Troödos, erstwhile Olympus of the gods, long years after it had been recorded by Guillemard I rediscovered the black-veined white and on the bare slopes below Platres saw for the first time *machaon* on the

wing. I see again the solitary *arbutus* round which two *Charaxes jasius* flew and sense once more my chagrin when I missed them and the joy at their eventual capture on another day. Then there was the evening when I went dusking in the forest with a torch and was mistaken for an incendiary and the whole hotel staff turned out to capture me, led by the cook in full regalia and armed with a butcher's chopper. Pleasant were those months spent in the mountains of Cyprus amongst the Corsican pines, where tiny ice-cold streams have cleft for themselves deep gullies whose sides are green with maiden-hair and colourful with flowers and where sometimes at high noon one sees the striped hawkmoth hovering at the pink blossoms of the oleander.

Followed two unsettled years in England with but scant collecting. A day in the hills behind Rio where Heliconiids and their mimics sported in the deep shade of the forest and where I first saw the wealth of tropic insect life; and lastly Argentina, the Silver Land that, stretching from Capricorn to the Antarctic*, from sea level to the high Andine peaks, covers an area more than a third as large as Europe, a land so vast that even after thirty years of almost continuous collecting it seems that I have hardly scratched its surface.

Here at first in the red quebracho forests of northern Santa Fé I came to know the tangled undergrowth of the snake-infested islands of the Paraná and the more open hardwood forests, the sawgrass-covered *esteros* that broke up the continuity of the woodland, and the pond-studded area with its riverain forest and fascinating exuberance of bird life that lay to the west of the Paraná and where I fished and shot and collected insects, camping by the rivers or in sun-drenched meadows purple with petunias.

There have been long months spent in the dense virgin forests of northern Misiones where the fauna is that of south-east Brazil and where in half an hour I have taken more than a dozen species of *Papilio* from a single patch of flowers; where sometimes the damp sand by the rivers is covered with a patchwork of bright colours from the multitude of drinking butterflies; where twenty years ago in six months of solitary collecting I added more than eighty butterflies and an untold number of moths to our country's fauna and where more recently with a colleague and assistant we increased in three months by forty, the hundred *Odonata* known from Argentina and, in spite of adverse conditions, brought back 120,000 insects.

There have been seasons spent in the dry mid-west, in La Rioja and Catamarca, where the forest is sparse and open and there are great areas of sandy plains covered with cactus and *jarilla** and salt marshes where only *Chenopodiaceae* flourish, but in whose mountains are little fertile valleys.

Trips to Mondoza with its vast expanse of vineyards and to the high Andes, to Patagonia with its incessant winds that sometimes for days on end prevent collecting, treeless till one reaches the western *Nothofagus* forests that skirt the Cordillera and where in spring the ground is covered with flowers, with yellow *Viola*, wild calceolarias, anemones and orchids and where big bumble bees are golden yellow.

* The distance from the Bolivian frontier to Tierra del Fuego is approximately equal to that separating London and Port Said.

**Larrea* spp. (Zygophyllaceae).

There are memories of days spent collecting with old friends in the suburbs of Buenos Aires and further out amongst the Tigre islands of the Delta and of an expedition to the mid north-west to search for overwintering locusts. Six years of citrus entomology in north-eastern Argentina where my territory, half as large again as England, gave opportunities for collecting in many corners untrodden by an entomologist that were followed by four years of agricultural entomology in the extreme north-west, in Tucumán and Salta and Jujuy, where the Bolivian fauna makes its influence felt and where the forests are sub-tropical and there are high upland valleys; where at 15,000 feet I have taken *Phulia* and at 10,000 caught *Colias blameyi* flying over freshly fallen snow.

There have been visits to the Pampa and the vast central plains where only the far horizon breaks the monotony of endless leagues of waving corn and grassland; weeks spent amongst the fertile lands of Buenos Aires and Entré Ríos; collecting in the hills of Córdoba of summer tourist fame and amongst the canefields of the north-west, and everywhere in the sandy xerophilous deserts that cover so much of Argentina.

And as my thoughts wander back over the years other incidents come to mind. The small stump rabbit netted as it fled from its home in a hollow log one midday in the Chaco, and a hare surprised in its form and whose capture nearly caused disaster to the net. Humming birds that I have taken as they hovered at some flower, mistaking them for hawkmoths, and a morning in camp when as a last resort the net was used for fishing after more orthodox methods had failed to provide us with a breakfast. How often too has the net bag served to carry home wild fruits or eggs or some reptile that could not otherwise be easily transported, or young parrots raped from their ancestral nests.

Only an old net, but what happy memories it revives!

Collecting in the 'Nineties

By P. B. M. ALLAN.

A note in the May issue of this magazine (*Ent. Rec.*, 65: 148) headed "The New Forest in the 'Nineties" referred to the abundance of butterflies in that renowned hunting-ground in 1893 and quoted a remark by a contributor in an earlier issue to the effect that the Victorian lepidopterists "lived in a land of plenty". The 'nineties—or at least some of them—were undoubtedly years of plenty for the lepidopterist, but I do not think any year in that decade was noticeably more prolific of butterflies in any particular habitat, except possibly the New Forest, than any "good" year, *e.g.* 1941, we have had since. We are part-way through a "bad" cycle of years and presently our Lepidoptera will be plentiful once again—in their restricted habitats.

It must be borne in mind that in the 'nineties there were many more habitats for Lepidoptera in England than there are to-day. The countryside came much closer to the towns: some hundreds of thousands of acres of open country round about the towns have now been built over; consequently the habitats of certain species have been reduced in number. But in those habitats which are still open or wooded country the populations of these species in any decade of this present

century are probably much the same, *ceteris paribus*, as they were in the 'nineties. They fluctuate just as they have always done and sometimes there are long spans of years, perhaps even a century or more, when climatic conditions are severely repressive to certain species—witness the Comma and the White Admiral, the Large Tortoiseshell and the Wood Argus. It is getting on for half a century since the Large Tortoiseshell and Purple Emperor were plentiful in the New Forest; that they will be equally plentiful there again some day is quite likely—provided of course that the Forest is not felled and built over. But the list of our Lepidoptera is not, and never has been, a stable one. Species die out and others arrive from the mainland to take their places. Prophecy is as unwise where Lepidoptera are concerned as it is in most other things in this uncertain world.

Of course there was much more uncultivated ground in England in the last century: since 1890 some 20 million more people have had to be housed and more food for them grown; the exigencies of two major wars have largely denuded our island of sizeable trees. So there were more common lands and woodlands and more marshy meadows which have since been ploughed and drained and are now good pasture or cornland. Waste lands overgrown with gorse and thorn bushes, which throughout the centuries had never known a plough, have been cleared, broken up with steam ploughs, and sown with grain. The 'rough bits', odds and ends of land on every farm, are almost non-existent to-day. The enclosing of common land and 'waste of the manor' has proceeded apace since the close of last century and it is still going on; one sees bungalows, fowl-runs, and garages being erected on common and waste land almost everywhere one goes. The abolition of manorial rights a few years ago has had effects which our legislators certainly did not foresee.

If I were asked to name the chief features, apart from bricks and mortar, which distinguish the English scene of the 'nineties from our countryside to-day I should say "the roads and hedges". Usually one could not see over the hedges when on foot and often they were eight or nine feet high. They were dense growths, chiefly of hawthorn, black-thorn, hazel, bramble and sallow (allowed to grow tall for use as poles and helves); but the wild rose grew rampant almost everywhere, filling the hedges with blossom throughout the summer. The rose was indeed the emblem of England. Perhaps its disappearance has been due not only to the cutting of hedges to within two or three feet of the ground but to the tarring of the roads. So in summer the hedges were great banks of blossom; for honeysuckle usually grew in partnership with the roses. At the foot of the hedges, encroaching on the verges, were wild flowers in profusion. The activities of rural district council surveyors in 'tidying up' their rural districts, urbanising them in fact, were still unknown. There were no kerbed 'sidewalks' in the villages; grass grew to the walls of the houses in the village streets.

Every road, whatever its size, was obliged to have a grass verge (usually one on each side) for the use of those who travelled on horse-back: no one who had regard for his horse's legs wanted it to "'ammer, 'ammer, 'ammer on the 'ard 'igh road". The width between the hedges being the same then as it is now it is plain that the metalled surface of lanes and byroads was only about one-third of its present width.

Actually most of the country lanes were wide enough only for one vehicle and a pedestrian or two, at most say eight feet. When you met a vehicle one of you, or both, pulled over partly or wholly on to the verge. The narrower the road, the less the cost of its upkeep and the more quickly it could be repaired. So nobody wanted wide roads, except of course those main roads upon which there was much traffic.

Throughout the centuries each parish had been required by the Common Law to maintain all the roads within its bounds; but in 1888 the Local Government Act assigned the upkeep of main roads (only) to the county councils. This Act made little or no difference to the countryside; it was not until 1909 that the Road Board was established, when powers were given to county councils to "improve" all the existing roads. "Improve" was defined as widening the road surfaces, cutting off corners, levelling, and acquiring land for these purposes. It was these "improvements" which eradicated the grassy flowery verges that had beautified our English roads ever since they had been trackways leading from one place to another. This 1909 Act was of course instigated by the coming of the motor-car.

It is plain that with all these luxurious hedges and flowery verges and waste lands and commons and large woodlands the country *as a whole* was capable of supporting a larger insect fauna than it supports to-day. The point I want to make is that although our butterflies now have the same populations in each habitat as they had in the 'nineties there are vastly fewer habitats. So to-day one is not so continuously in the presence of butterflies in whichever direction one goes. For not only have the towns and cities spread out into the country but villages are often double and treble their former size; many of the smaller towns of the 'nineties are now almost cities. Also there are new towns and villages. The town of West Reading did not exist when I was a boy; Golders Green was open fields as far as the eye could reach. It is the eradication of habitats by bricks and mortar that gives us the impression that our butterflies have become scarcer.

As a fact, some butterflies are much more common to-day than they were in the 'nineties, notably the Marsh Fritillary, which had disappeared from many a county where it now flies again. The White-letter Hairstreak also was much more local and not nearly so widespread across England and Wales, though the contrary could be said of the Large Tortoiseshell. The Wood White also ranged further to the east: it was flying in Essex in the 'eighties. As for all the other butterflies, so far as the southern half of England is concerned I should say that there has been no change at all, the two obvious exceptions being the Comma and White Admiral. The Heath Fritillary had died out in Staffordshire and Essex long before the 'nineties. *Papilio machaon* was no more plentiful at Wicken and on the Norfolk Broads than it is in a "good" year of our present era. If there were more butterflies in England there were also more of their predators and doubtless the populations of their predators are in the same proportions to them as they have always been.

It is an old story. *P. machaon* was common at Battersea (on the south bank of the Thames at London) two hundred years ago and so was *Cossus cossus* in the same place. Mark the sequel: bricks and mortar have long since obliterated *machaon*, but *cossus* occurs in Battersea

Park to-day as it did in 1753. For in this case the habitat, namely trees, has not been obliterated. Only a few years back Mr. Neville Chamberlain found a *Zeuzera pyrina* at rest on the trunk of a tree in the garden of No. 10 Downing Street and doubtless *pyrina* occurs in all the London parks. It has not been "introduced" to London; it was there when Boadicea chased the Romans out of the town and for several thousand years before that. Plainly if every tree and sizeable bush in London were felled the Leopard Moth would become extinct in that place; but that would be the only way to eradicate it.

So I see no reason for the present-day collector to be gloomy about the future of our island entomologically. Man cannot rid himself of butterflies and moths permanently in any other way than by covering their habitats with bricks and mortar, and so long as there are woodlands and open country, so long will there be butterflies and moths.

But so far as collecting is concerned there certainly is a very great difference indeed between the 'nineties and the 'nineteen fifties. If one may judge by the magazines the pursuit (not of course the science) of Entomology reached its zenith during the last decade of Queen Victoria's reign and it has declined ever since. There may have been fewer dipterists and orthopterists, but without question there were many more lepidopterists and coleopterists than there are to-day. There were five entomological societies in London. During the decade 1890-1899 the entomologists who were sending notes to, or writing regularly or irregularly for, the three chief entomological magazines in this country (*Ent. mon. Mag.*, *Entomologist*, *Ent. Rec.*) numbered about 1,099.* In 1950 the number of persons who contributed to these three magazines was 293.

The *Exchanges and Wants* in these magazines provide a good indication of the activities of collectors. For instance in the *Record* of September 1892 the notices of these enthusiasts filled four pages of small type. Between 1890 and 1899 the *Entomologist* printed the "swops" of 346 collectors, the *Record* 348. In 1950 the figures were 12 and 15 respectively. "O Hamlet, what a falling-off was there!" Many of these collectors advertised their swops in both *Entomologist* and *Record* at the same time, the total number of collectors who were making use of the *Exchanges and Wants* pages in both magazines during the decade being 518. In 1950 it was 26.

On all counts therefore it is plain that the Good Estate of Entomology was in a healthier condition during the 'nineties than it has ever been since. The remarkable thing is that people had much less leisure in those days. There was no working eight hours a day, with Saturday morning off: the wage-earner normally worked ten hours a day and most employers a good deal more. Also there was no leaving the office early on Friday afternoon in order to motor down to the seaside or country cottage for the week-end, returning to work at ten o'clock on Monday morning. The employer was often the last man to leave the

*Margin of error plus or minus 5. The printer did his best with illegible signatures, and when his best did not satisfy a contributor the editor usually received an expression of wounded feelings, the name this time being written in capitals. When therefore no address follows the name, Mr. I. W. Frush in, say, the June issue may be the same person as Mr. J. M. French later in the year; but often both names would be included in the List of Contributors, from which I have compiled my statistics.

office on Saturday, taking the opportunity to tackle a few arrears in quiet after the staff had left. There is food for thought in the truism that the busier a man is, and the longer the hours he has to work, the more profitably will he spend his leisure hours.

If the *Exchanges and Wants* pages show a falling-off in the number and activities of present-day collectors the advertisements in the magazines stress that regression no less strongly. During the 'nineties 20 firms or individuals were offering to supply the entomologist with various requisites comprising everything that he needed for his work in the field and at home. In 1950 the firms of this description who advertised in the three magazines numbered 3! Between 1890 and 1899 those who advertised live insects for sale numbered 25. In 1950 the advertisers of livestock in the three magazines numbered 4. In addition, 24 other dealers advertised specimens set or in papers. In 1950—one.

So, after all, our contributor was not so far out when he remarked that the "Victorian lepidopterist lived in a land of plenty". But it was not to the butterflies only that his dictum applied! Perhaps in view of the great restriction of habitats to-day it is not a bad thing that there are so few collectors. Nature's ways of "preserving a balance" are remarkable indeed. . . . !

Notes on Life-Histories

In a short paper which he contributed to the *Ent. mon. Mag.* in 1892 (vol. 28, p. 147) Major J. N. Still "put down a few facts in the life-history of this handsome species that have come under my immediate notice." The "handsome species" was *Colocasia coryli* L. and lepidopterists who have reared this insect will agree the epithet. "Why the English name (the nut-tree Tussock) is given to this moth," he began, "I cannot understand, for out of the many dozens of the larvae that I have beaten out, I have never got one from the nut, the greater proportion were from beech, although the oak has yielded a few." This was written from Devonshire and *C. coryli* was said to be more common among the beechwoods on the lower slopes of Dartmoor than it is elsewhere except perhaps in the Chilterns. But away from those great stretches of beechwood the moth is widely distributed throughout our island and no experienced lepidopterist would call it rare.

We have found the larva as often on hazel as on beech. Allan's *Larval Foodplants* gives hawthorn, birch, hornbeam, alder, blackthorn, maple and apple as well as beech, oak and hazel, and Lhomme avers that so far as France and Belgium are concerned the foodplants are (in this order) *Corylus*, *Crataegus*, *Betula*, *Carpinus*, *Fagus*, *Quercus*, and *Salix*. So the moth has catholic tastes and, perhaps, local preferences. In Devonshire, Still found that "stunted beech bushes in hedges" were much more prolific than beech trees and that "a bleak and exposed situation, at an altitude of 500 to 700 ft., much more so than the sheltered lower ground." Yet we have found the larva not uncommonly in hazel hedges on watermeadows beside a big river as well as on the lower branches of large beech trees on limestone hills 500 feet above those same watermeadows. Barrett was of opinion that *C.*

coryli undoubtedly has a preference for the higher ground—"particularly affecting hill tops and sides, and hedges in other exposed situations" are his words. But here he may have been quoting Major Still, for he goes on to mention that the larva prefers bushes to trees.

The moth used to be common, and perhaps still is, in Epping Forest, which is not particularly high ground, and Still's opinion "I feel sure that where the beech thrives, there *coryli* will be found if thoroughly looked for" is probably correct. As for its distribution Barrett says "Plentiful in Devonshire, and also in Berks. and Bucks. on the hills among beech", which information he obtained, one imagines, from Still and the Reading and Marlow collectors. But so far as Berkshire is concerned it seems likely that Barrett jumped to a wrong conclusion. The Reading collectors of the 'nineties—Butler, Clarke, Hamm, Holland—took *C. coryli* freely every year but not in Berkshire: they collected it on the Oxfordshire bank of the Thames, in the beechwoods that clothed the chalk hills beneath which Thames flows. The gravels of the lower Berkshire terrain, the clays of the Thames valley, the heather and pine areas, the open chalk downs, all seem unlikely localities to harbour *coryli*.

"The female", says Major Still, "lays some fifty to seventy ova." Perhaps the words "in captivity" should have been added; for we cannot call to mind any other of the larger moths which normally lays so few eggs. Still gives no reason for his assertion nor any account of his observations on this point. "The date (of oviposition) last year with me," he went on, "being the 15th May; they hatched on the 11th June, the first to pupate did so on August 15th. The larvae are extremely easily reared, but care is necessary to avoid their being thrown away with the foodplant during their moults, which take place between united leaves of the beech, where they seem to spin a web-like cocoon; the period of change lasting two to four days." Our own experience has been that the larvae about to moult not only "seem" to spin a web-like cocoon but actually do so. The "web-like cocoon", however, does not differ to any extent from the contrivances made by many other species (e.g. *Polyphlocia ridens* Fab.) for security during ecdysis.

"They feed at all hours of the day and night, which, I think, accounts for one's being able to beat several larvae from the same bush that a few hours before yielded none; when not feeding they are almost invariably between leaves, and are then most difficult to dislodge". Our own observations of these larvae in cages certainly bears out Major Still's remarks: the larvae do undoubtedly feed spasmodically throughout the day; but we have not noticed that they retire to a hiding-place between leaves as soon as they have finished a meal. Have other observers noticed this? What we have noticed is that when a feeding larva is disturbed it arches its thoracic somites and porrects the red 'horns' (tufts) very much in the manner of a bull facing the matador! What is the biopsychological significance of this?

"In the breeding-cages I have never seen the larvae change on or under moss, although placed there for the purpose; all that I have reared during the last two seasons have changed between united leaves, of course in the wild state this may be different." We have found that in captivity strands of dried moss are frequently incorporated into the cocoon, and in the West Country we have occasionally found the pupa

underneath moss rather low down on the trunks of large beech trees. But in a drier climate (e.g. the Chilterns) it is possible that the larva descends the tree and wanders about among the dry debris at its roots before spinning up between leaves, etc. Finally Major Still records that he had "taken the larvae on two sides of the city (Exeter), and last season forty dozen within twelve miles of Exeter". Nowadays *C. coryli* is being taken in its haunts by most users of the m.v. lamp. Variation is considerable; indeed Still remarked "what I have always considered the type seems this year to be the most uncommon form".

Current Notes

How times change! Our good friend, Mr. S. Gordon Smith of Chester, writes: "I have had very little success with light so far this season; but I did manage to attract 12 *A. alni* in Caernarvonshire last month in two nights." *Very little success*—yet in *two nights twelve* specimens of a moth that until a very few years ago was accounted one of the rarest British species! Indeed only ten years ago the man who could claim that he had taken six *alni* in forty years' collecting was looked up to as a fine field lepidopterist and he who could show a drawer containing a series of immaculate bred specimens was entitled almost to reverence.

Two correspondents have demurred at the remarks on 'county' lists printed in our May issue. One chides us gently and courteously as becomes the great lepidopterist he is, hoping that the three best of these lists which have yet appeared were not meant to be included in our strictures. And indeed they were not: they were far from our mind when we wrote in haste (even as King Solomon did) that we had yet to see a county list which was even remotely accurate. Our other critic casts all restraint to the winds, abuses us roundly, and after desperate efforts to make the cap fit himself ends up by informing us that he is not (and, so far as we can discover, never has been) a supporter of this journal. He also assumes that our criticism was directed at his own list, of the existence of which, incidentally, we were unaware.

So far from discouraging the compilation of 'county' lists our criticism concerned, and was directed at, those lists which, by reason of the method whereby most of them are compiled, are inaccurate and misleading. We repeat our words: ". . . the only county list which the zoologist can use for scientific work is the list compiled by an individual whose work is known to be invariably accurate, therefore reliable." This is the reason why the few lists which we single out for mention are in a class by themselves: each one is the production of a scientific and, therefore, highly critical, entomologist of national repute.

The information given in the late Claude Morley's Suffolk list is invariably accurate. The text is marred by misprints, there is no index, and the order in which it is arranged is, at times, infuriating. But, we repeat, the information about species and habitats which it gives is accurate. Mansbridge's list for Lancashire and Cheshire, 1940, also is very good. But the best county lists which have been issued so far are those for Cheshire and of six of the Welsh counties, all prepared

by S. Gordon Smith. They are so good that they should serve as models which the compilers of all future county lists should copy and as standards to which all future annalists should strive to attain.

A few days ago we came across some remarks of Charles Golding Barrett on this subject. He was writing in 1892 (*Entomologist* 25: 215). "There is one difficulty in asking for lists: it seems to include an obligation to accept them, faults and all. And nowhere does there seem to be a greater risk of error than in compiling a local list. Every species that somebody thought that he saw, and every one that has been wrongly named, is sure to creep in." So the local Society which embarks upon the compilation of a local list should make sure first of all that it can entrust the editorship not necessarily to an elderly collector but to an experienced lepidopterist who is a sceptical autocrat (however kindly and tactful), who keeps science always to the fore-front of his mind, caring not a jot about including "as many species as possible", and obsessed only by the essentiality of accuracy.

During the last few years a North American Arctiid has reached Eastern Europe and has not only established itself there but appears to be extending its range with some rapidity. The species is *Hyphantria cunea* Drury (= *budea* Hub., *punctatissima* Sm. & Abb., *mutans* Wkr.), and in appearance the imago resembles our *Cynia mendica* Clk., in fact at first sight it might well be mistaken for a small female of that species. The ground colour of all four wings is white, the fore wings having a number of small irregular black dots, the hind wings entirely white. Wing span 3 cms. The abdomen is covered with white hairs. The egg stage lasts eight days, the pupal stage about twelve days, and there are two, sometimes three, broods in a year. Hibernation is in the pupal stage.

The larval habits resemble those of *Malacosoma neustria* L. On emerging from the egg the young larvae together spin a common web enclosing a leaf, and as they grow, more leaves are enclosed in the 'nest'. After the third moult they leave the 'nest' and spread independently to the neighbouring leaves and branches. They are virtually omnivorous: in Eastern Europe they have been found on fruit trees of all kinds, hazel, vine, ornamental trees and shrubs (including *Ailanthus*, *Robinia*, *Celtis australis*, and maples), forest trees (oak, ash, willow, lime) garden vegetables of various kinds as well as on lucerne, hop, maize, tobacco, nasturtium and dahlia, also on *Triticum repens* and stinging nettle. The difficulty of dealing with the pest by chemical means is, therefore, apparent. One dipterous (*Compsilura concinnata* Meigen) and five hymenopterous parasites are known.

In May 1940 two specimens of the moth were caught by a lepidopterist near Budapest, but no attention was paid to this and the insect remained unnoticed until 1946, by which time it had increased considerably. Since then it has spread through Central Europe "with extraordinary rapidity". By 1947 it had already overrun three-quarters of Hungary and had reached the frontiers of Czechoslovakia, Austria and Yugoslavia. Now it has invaded these three countries and appears to be pressing on towards Italy, Switzerland and France, though since 1952 its rate of progress seems to have slowed down somewhat. Entomologists

in the countries afflicted by this pest are attempting to introduce and acclimatise its North American parasites. There is a short paper on this moth by M. Jacques d'Aguilar in the *Bulletin de la Société Entomologique de France*, 58: 7 (1953, No. 1), from which the above information has been taken.

The common blue-tit (*Parus caeruleus* L.) is perhaps the chief avian predator of lepidopterous larvae in this country and several observers have recorded the number of caterpillars taken to a nest of young tits by the two parent birds in the course of a single day. We have watched one of these birds clearing batches of first instar larvae of *Mamestra brassicae* from gladiolus—a welcome sight, for *M. brassicae* is a perennial pest of the sword lily in our garden. But not until recently have we heard of starlings performing the same function. Browsing on an old volume of the *Entomologist's Monthly Magazine* (1890, vol. 26, p. 216) we came across the following:—

“On the 6th of this month (June) Captain Robertson and I went to get some larvae of *populeti* from some low trees of *Populus tremula* which were covered with that species. Captain Robertson had picked off about 100 larvae the night before; but this morning when we arrived at the trees, we found some starlings had also discovered the caterpillars, and had gone over the trees systematically from branch to branch, pecking a hole in one side of the spun together leaves, and drawing out the caterpillar, and so nearly had they cleared them all off, that we had much trouble to find a dozen. We caught the birds in the act, and although they had so nearly finished their feast they were very unwilling to go, and loudly objected to our disturbing them.—W. HOLLAND, *Reading, June 21st, 1890.*”

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Donacaula mucronellus Schiff. This pretty and rather secretive moth is on the wing in July; I have usually seen it as its best in the second and third weeks. It is often said that it flies in the early evening; I have seen only one odd specimen then and I think the idea has gained credence from Barrett's account (vol. X, p. 134) of its habits; but he specifically states that he saw it at that time only on one or two occasions.

Its natural flight begins at dusk, but on warm nights there is a much larger flight from 12—1 a.m. when it may be found with a hand-lamp in its chosen haunts and is strongly attracted to a brighter one. I have seen large numbers and taken all I wanted on the Broads when rowing round the edges of the reed-beds with the back of the boat covered with a sheet and a petrol vapour lamp standing on a box on the stern seat. The insects should be netted before settling as the sheet in this position soon becomes saturated with dew and a delicate insect like *mucronellus* is quickly spoilt if allowed to flutter on it. *Crambus paludellus* Hüb., *Schoenobius forficellus* Thunb. and *S. gigantellus* Schiff. will be taken at the same time, though *S. gigantellus* is at its best a fortnight earlier. The females of these must be killed at once as they soon damage themselves, if kept in pill-boxes, by knocking off the pointed tips of the

forewings characteristic of the female sex in all these insects. The males may be carried home in the usual way.

Stenia punctalis Schiff. This moth is particularly fond of hiding in vegetation at the foot of cliffs by the sea on the South Coast, where it stays close to the ground amongst grass-roots and rubbish. It is chary of flying but runs quickly on its extremely long legs and flits into the thicker parts. It is easier to take in the evening, as by day, though readily disturbed, it creeps so much to the thicker places as to be difficult to extract in good condition. It comes, however, pretty freely to a lamp standing on a sheet on the ground at Dungeness, etc., and can easily be boxed then as it scuttles over the sheet.

Hapalia fulvalis Hubn. I believe only two specimens of this *Pyrallid* had been recorded when, in the winter of 1931-32, Captain Cyril Diver showed me a number amongst insects he wished me to identify which had been taken by him near Parkstone in Dorset in July 1931. In 1932 he kindly took the late Sir John Fryer and myself to the locality and we found the moth commonly, flying at early dusk round garden hedges. Fryer kept some for eggs and succeeded in rearing a few. I was moving from Cliftonville to Westcliff at the time, so was unable to look after any larvae.

Phalonia gilvicomana Zell. has had a somewhat chequered history as a British insect. It was first taken in some numbers in 1879 by the late F. O. Standish, it is supposed in Gloucestershire; but he died the following year and nothing further was heard of *gilvicomana* until the late 20's of the present century, when the late Professor E. G. R. Waters took it near Lynton in Devonshire. It seems quite possible that this may have been Standish's locality; but as the moth has obscure habits it may just as well have been an inhabitant of Gloucestershire, where its foodplant is locally common. Waters gave his locality to Sheldon and myself, and Sheldon discovered several localities for it near Lynton and also the foodplant in this country, *Lactuca muralis*, from which he bred it.

P. gilvicomana does not fly in the same way as most *Phalonia*, which usually flit and buzz amongst low vegetation. Waters and I both found most of ours flying about five feet from the ground. Mr. Wakely afterwards found the larva common in a Surrey locality. It is very easy to rear if the *Lactuca* stems and seeds are placed in a fifteen-inch flowerpot with good drainage, covered with muslin, and left in the garden. But when emergence time arrives the pot should be brought into the house, or a net taken in hand directly the muslin is raised, as *gilvicomana* is skittish and I lost several trying to box them from the pot in my garden.

I always find that micros, and many macros, do best in the winter if left severely alone in the garden, provided the pot be big enough and the drainage good. Suggestions are often made such as half burying the pot, shading with glass in wet weather, etc. I have never bothered about any of these things and find from talking to my friends that I do quite as well as the most careful and ingenious of them.

P. gilvicomana is on the wing in July and the larva may be collected in August. It seems to like a place, such as a clearing, where quantities of *Lactuca* grow.

[There is a paper on *P. gilvicomana* and its foodplant, by W. G. Sheldon, in *Entomologist* 79 (1937), pp. 197-199. The generic name of *L. muralis* formerly used on the Continent was *Prenanthes*. It is a woodland plant, local but not uncommon in England, and occurs also (according to Bentham & Hooker) at Perth and Stirling, but is known only from Wicklow and Louth in Ireland. The leaf somewhat resembles that of *Sonchus arvensis*. The moth is figured in Barrett, vol. X, plate 459.—ED.]

Notes and Observations

EPISCHNIA BANKESIELLA RICHARDSON IN PEMBROKESHIRE.—When collecting at Tenby, Pembrokeshire, on 24th July 1951 I took a specimen of a Pyralid at the m.v. lamp which was new to me. I had some difficulty in identifying it so put it to one side pending expert opinion. Now through the good offices of Mr. Tams the moth has been identified by Mr. E. L. Martin of the British Museum (Natural History) as *Epischnia banksiella* Richardson. Previously recorded only from the Dorset coast the present record demonstrates that the species has a much wider range and may possibly have been overlooked.—NEVILLE L. BIRKETT, 3 Thorny Hills, Kendal. 4.vi.1953.

CELERIO LIVORNICA ESPER AT SALISBURY.—On 3rd June 1953 I received two specimens of *Celerio livornica* Esp. for identification or confirmation. One was taken on the wall of St. Martin's Church, Salisbury, by Mr. Fitzroy Jones of Westbury, the other was from Tollard Royal near Salisbury where it was found on the grass verge by the roadside by Miss Vere Temple, F.R.E.S.—C. M. R. PITMAN, 'Malvern', Southampton Road, Clarendon, Salisbury, Wilts. 30.vi.53.

A DWARF RACE OF ANTHOCHARIS CARDAMINES L. In a previous article (*Ent. Rec.*, 64: 317) I referred to the existence of *Anthocharis cardamines* ab. *hesperidis* in the clearing in Park Hills woodland in Hampshire. The only tree-growth here consists of widely-spaced saplings of ash and Scots pine. The sloping surface is thickly covered with numerous species of wild flowering plants, but the only likely food for *cardamines* is a weak form of *Cardamine pratensis* (Lady's Smock). This is not plentiful and the petals are mostly white with only a mere trace of the richer mauve of the marshland blossoms.

The several visits made to the locality this year revealed that approximately 80% of all *cardamines* were dwarf, ♂♂ averaging 36 millimetres in expanse. The ♂ population more than doubled the ♀ in numbers, the size average of the latter being 38 millimetres. The orange tip on most of the ♂♂ just reaches the discal spot.

On 10th May every specimen observed was a dwarf, whereas in the immediate surrounding pastures they were all of normal size. This seems to indicate that *cardamines* is no great traveller, probably limiting its range to within a given radius.

Examination of the soil content revealed an entirety of clay, hence the stunted growth of *C. pratensis*. In the surrounds where normal butterflies predominate this plant is lush and colourful; an occasional large patch of *Erysimum alliaria* (Garlic Mustard) provides another favourite food.

The cause of dwarfism, therefore, in this instance would appear to be fundamentally mineralogical. In view of this perhaps the name *hesperidis* should only be allotted to a dwarf aberrant occurring in a habitat producing typical insects.—PAUL H. HOLLOWAY, Warwick House, Fair Oak, Eastleigh, Hants. 18.v.53.

POECILOPSIS LAPPONARIA BDV. IN INVERNESS-SHIRE.—The chance discovery of a belated female of this interesting species on 4th May 1952 near Newtonmore caused me to make a widespread search in 1953. As I believe this to be a new record for this part of Inverness-shire I think it may be worth while to record further that my 1953 search has succeeded in locating four separate colonies in the Newtonmore district, extending from Kinloch Laggan to Kingussie, at heights above sea-level ranging from 700 to 1,500 feet.

On 6th April 1953 I had the good luck to observe the assembling flight of the males. The day was sunny, and at about 1800, an hour before sunset, the males began flying, and soon there were several congregations of up to a dozen fluttering over single females ensconced in the bog myrtle bushes. The flight continued until sunset, and then appeared to stop.—G. W. HARPER, Nedaich, Newtonmore. 13.v.53.

ANTHOCHARIS CARDAMINES L. IN SCOTLAND.—At noon on 8th May 1953, a fine sunny day, I was amazed and delighted to take a ♂ *A. cardamines* flying along the Tromie burn, a tributary of the Upper Spey in Inverness-shire. The pleasure was increased when on subsequent days I took six further fresh male specimens, five near Aviemore* and one at Boat of Garten, indicating that the insect was occurring throughout the whole valley of the Upper Spey, where one of the food-plants, *Cardamine pratensis* L., is widespread. Search for females and eggs, however, has not yet been successful.

Further information on the present-day status of *A. cardamines* in Scotland is needed in order to determine whether it is increasing in numbers and distribution. Twentieth century records are very meagre. R. Richter, in *The Scottish Naturalist*, 62: 123 (1950) states that he has found the butterfly commonly in Morayshire "during the last four years". Prior to this record, F. W. Smith, in the same publication, 61: 32 (1949) can find only three records since the turn of the century, all for Southern Scotland. In the same interesting paper he summarises the earlier records and maps the distribution, which is confined roughly to Southern and Eastern Scotland. He concludes that Dr. E. B. Ford's statement in his book *Butterflies* (1945, pp. 128-9) is not borne out by the Scottish records, certainly of the last fifty years.—G. W. HARPER, Nedaich, Newtonmore. 1.vi.53.

[*I saw a large male *A. cardamines* during the latter half of May 1944 about 1½ miles south of Aviemore.—ED.]

EUBLEMMA PARVA HÜB. IN NORTH-WEST SURREY.—On the morning of 25th May I found in my light-trap here a male *Eublemma parva* Hüb. in fine condition. It was probably an immigrant, perhaps accompanying the score of *plusia gamma* L. and odd specimens of *Nomophila noctuella* Schiff. and *Agrotis ipsilon* Hufn. which appeared on the same and the two previous days. I can trace only thirteen previous British records of *E. parva*, and this appears to be the first for an inland

locality. At least five of them are for late May or early June, and there is no evidence that the species has ever bred here. It is, however, doubtless often overlooked, and should be carefully watched for. In size and colour it resembles a Tortrix of the *Phalonia* group, but its sitting posture is quite different, and I suspected it at sight of being a *Eublemma*. The illustration in 'South' is blurred and too dark; but it is excellently shown in Herbulot, *Atlas des Lépidoptères de France*, Fascicule II, figure 246.—R. F. BRETHERTON, Ottershaw Cottage, Ottershaw, Surrey. 3.vi.53.

EUBLEMMA (*THALPOCHARES*) *PARVA* HÜB. IN GLOUCESTERSHIRE.—I have to record the capture of a specimen of *Eublemma parva* on 29th May in my garden at Hardwicke in Gloucestershire. I found it at mid-day resting on a leaf of delphinium; I think it is a female. Its resting place may be the result of the m.v. light which was operating in the garden on the previous night.—R. P. DEMUTH, Hardwicke, Gloucester.

[There seems to have been a very large immigration of this moth. We have heard of 33 others.—ED.]

APATELE ALNI L. AND *PYSCHÉ OPACELLA* H.-S. IN DERBYSHIRE.—I have one good thing to report. On 25th May I was searching the boles of a line of 300-year-old beech trees in Tupton Park, a routine check which has become a habit since I went to school there. It was the first time, however, that I had ever come across *Apatele alni* L. It was a perfect newly emerged male specimen resting about one foot above the soil on the north side of the trunk. I almost lost it in my eagerness to box it: it flew off as I moved the box towards it, but luckily it rested on the ground long enough for me to recover myself.

Another find which may be of interest concerns one of the Psychidae. While I was searching the walls on Beeley Moor on 23rd May I saw a tiny black moth resting on a case made of old bits of grass. Closer examination revealed it to be a male specimen of *Psyche opacella* H.-S. I searched the wall thoroughly for more cases, but without success.—J. H. JOHNSON, 53 Knighton Street, Hepthorne Lane, Chesterfield. 27.v.53.

ACHERONTIA ATROPOS LINN. AT WESTON-SUPER-MARE IN MAY.—It may be worth recording that I took a specimen of *A. atropos* L., which was attracted to my mercury vapour lamp in my garden at Weston-super-Mare, on the night of 24th May last.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 29.v.53.

ACHERONTIA ATROPOS LINN. IN BIRMINGHAM.—On 1st June I was given a specimen of *A. atropos* L. This moth had been caught on the previous day and was still alive when I received it. It had been found on a lawn close to a beehive in the Weoley Castle suburb of Birmingham.—CARTWRIGHT TIMMS, 524 Moseley Road, Birmingham, 12. 6.vi.53.

HYLOICUS PINASTRI L. AT LIGHT IN CAMBRIDGE.—Amongst the few species which came to the m.v. lamp in my garden on the night of 22nd May 1953 was a fine male example of the Pine Hawk. He was an unexpected visitor, to say the least of it, since *Pinus* is scarce in this neighbourhood, the nearest being a plantation of less than one hundred

trees a quarter of a mile to the south-east and a few specimens in the University botanic garden a mile away in the opposite direction. I can find no record of *H. pinastri* having been taken previously in Cambridge-shire.—W. H. STOREY, Fairstead, Long Road, Cambridge.

EARLY APPEARANCE OF *HYLOICUS PINASTRI* LINN. IN BOURNEMOUTH.—On 16th May 1953 I found a ♀ *H. pinastri* L. close to the ground on a pine trunk in a main road not far from the Lansdowne, Bournemouth. I first saw it soon after 2.0 p.m. and had no box with me, and was unable to take it until about 6.0 p.m. During the interval hundreds of people must have walked past it within two yards without either noticing or disturbing it.—H. SYMES, 52 Lowther Road, Bournemouth. 15.vi.1953.

MIGRANT MOTHS IN EAST DEVON.—I took a specimen of *Laphygma exigua* Hüb., worn, at light here on the night of June 12th-13th, and a *Heliothis peltigera* Schiff. on June 13th-14th.—F. H. LYON, Sampford Peverell, Tiverton, Devon. 15.vi.53.

PROTRACTED EMERGENCE OF *PANOLIS FLAMMEA* SCHIFF.—From about 40 larvae of *Panolis flammea* Schiff. of all sizes beaten near Aldeburgh, Suffolk, last summer, 23 moths resulted from 29th March to 18th May 1953. Four emerged on 29th March, eight in April, and eleven in May (two on the final date, 18th May).—F. H. LYON, Sampford Peverell, Tiverton, Devon.

EARLY APPEARANCE OF *ODONTOSIA CARMELITA* ESP. IN THE SOUTH.—In his note on this subject in *Ent. Rec.*, 65: 182, Baron de Worms states that his capture of a ♂ *carmelita* at Horsell Common on 15th April 1953 was the earliest date he had known for this species. On looking up my records I find that I took a pair of *carmelita* between Brockenhurst and Lyndhurst on 7th April 1945. They were resting about five feet up on the trunk of a large birch tree not far from the trees on which Baron de Worms took two females this year. I note, not without satisfaction, that he found them both on large trees, that the newly-emerged specimen was only a foot from the ground, where it had probably mated during the previous night. These details confirm my own experiences with this species. I think 7th April is an exceptionally early date for a wild *carmelita*. My other dates for this species in the same locality are 21st April (1942, 1943), 23rd April (1940, 1941), 26th April (1940).—H. SYMES, 52 Lowther Road, Bournemouth. 15.vi.1953.

TIME OF APPEARANCE OF *COLIAS CALIDA* VERITY.—M. Berger in his note "A *Colias* new to Britain" (*Entomologist*, 81: 129) states that the specimens figured in South's *Butterflies of the British Isles*, Plate 21, represents the new species, "on the other hand, figures 3-5 on Plate 25" (should be 26) "of Ford's *Butterflies* represent true *hyale*". Baron de Worms, referring to these species in an article in *Entomologist's Gazette* (2: 154), says "The Pale Clouded Yellows seen in this country in May are always *C. australis (calida)*, since the first brood of *C. hyale* does not appear before mid-June or July". However, in the text of *Butterflies* (p. 203) Ford refers to ". . . the female Pale Clouded Yellow, *Colias hyale*, illustrated on Plate 26, Fig. 4, which I found in May flying at the foot of White Horse Hill, Berkshire". Since these three state-

ments cannot be reconciled, it would be interesting to see which of them requires modification.—T. H. FORD, 275 Derbyshire Lane, Sheffield, 8. 14.v.53.

HABITATS OF PARARGE AEGERIA LINN.—In his article on the habitats of *Pararge aegeria* L. in the current issue of the *Record* Mr. D. F. Owen asks for further information. I have seen *P. aegeria* in single specimens quite regularly since 1946 in my garden here on the borders of Leicestershire and Northamptonshire. I was extremely surprised when I first saw it, as my garden is a walled one and is very hot and bright in the summer, and quite different from the conditions under which we expect to see this insect flying. I would emphasize that this is casual and I have never seen it in any quantity. The nearest woods are about two miles away.—HERBERT A. BUCKLER, Sutton Bassett, Market Harborough. 19.v.53.

—Anent a letter in last month's *Ent. Rec.* about *P. aegeria* in open spaces away from woods, it may be of interest to report that this insect is common round Ivinghoe Beacon and the downland close to it.—S. H. KERSHAW, Alderman's Place, Aspley Heath, Bletchley, Bucks. 28.v.53.

VARIATION IN ARCTIA VILLICA LINN.—On 25th June 1951 a friend gave me an *Arctia villica* ♀ taken at Bournemouth, which insect provided me with 262 eggs. By good fortune the larvae were safely wintered and all was well in the spring of 1952. They fed up on dandelion and groundsel, and ultimately produced 247 moths during June 1952. Of this total only two showed anything in the way of variation, which consisted of confluent spots on the forewings. However, a small dark genetical mark in the form of an extra dusky spot in the centre of the hind wings was present in one of two females, and it was possible to obtain one or two pairings. In my experience this species differs from *Panaxia dominula* L. in the fact that the imagines seem to be reluctant to pair in captivity. From the paired females approximately 500 larvae were eventually obtained, as well as some thousands of infertile eggs from unmated females. The larvae again wintered successfully and as before fed up on dandelion and groundsel. Almost 100 per cent. pupated and are now emerging. This generation shows a marked increase in variation. Apart from a larger number with confluent spots on the forewings some have the spots reduced in number and size. The same applies to the hind wings also; one has suffused black hind wings, and on 1st June 1953 a male emerged which was completely black on all wings and body. There have been less than 50 emergences so far, and it will be interesting to see what is forthcoming from the remainder.—C. M. R. PITMAN, Malvern, Southampton Road, Clarendon, Salisbury. 3.vi.53.

PHRAGMATOBIA FULIGINOSA L. ♂♂ ATTRACTED BY SCENT OF ♀ PANAXIA DOMINULA L.—On 26th May a young collector friend, who was breeding *P. dominula* ab. *bimacula*, put a ♂ and ♀ in a cage to pair, towards dusk. Shortly afterwards he saw two reddish moths fluttering round the cage. They proved to be ♂♂ *P. fuliginosa*. He watched for a few minutes and noticed that the two *dominula* were not taking any notice of each other. He then opened the cage and let in the *fuliginosa*. One of the latter ♂♂ at once clasped the ♀ *dominula* with his forelegs.

He was at once driven off by the ♂ *dominula*, which then paired with the ♀ *dominula*.—S. H. KERSHAW, Alderman's Place, Aspley Heath, Bletchley, Bucks. 28.v.53.

INCIDENCE OF ARGYNNIS EUPHROSYNE L. IN 1953.—*A. euphrosyne* is much less scarce in this area than for the last three years, and the females are laying freely. I saw the first one, a male, on 12th May.—S. H. KERSHAW, Alderman's Place, Aspley Heath, Bletchley, Bucks. 28.v.53.

HIBERNATION OF VANESSA ATALANTA LINN.—On 15th March a friend of mine found an *atalanta* in his mother's drawingroom and turned it out on an early primrose, upon which it fed.—S. H. KERSHAW, Alderman's Place, Aspley Heath, Bletchley, Bucks. 28.v.53.

AN ABERRATION OF CHIASMIA CLATHRATA LINN.—Yesterday afternoon, 14th June, I went to Fleam Dyke, near Newmarket, with my friend, D. A. Ashwell. He took an aberration of *C. clathrata* which appears to be identical with that figured in Barrett's *Lep. Br. Is.*, vol. vii, Pl. 281, fig. 11, from the coll. of S. J. Capper. Has this aberration a name?—CLIFFORD CRAUFURD, Galloway Road, Bishop's Stortford, Herts. 14.vi.53.

[*ab. alboguttata* Fettig: Dobiasch Almanack 1889, 43 = *nigricans* Oberthür 1896, *nocturnata* Fuchs 1898, *aethiopissa* Meves 1914.—ED.]

PUPATION HABITS OF AFRICAN SATURNIIDAE.—With reference to Dr. Kettlewell's note on this subject (1953, *Ent. Rec.*, 65: 118), I have noticed occasional pupae enclosed in the larval skin in all the African species of Saturniidae with subterranean pupae that I have bred, but I have never considered it to be a general rule.

I have bred the following species:—*Bunaea alcinoe* Stoll., *Nudaurelia dione* F., *N. amathusia* Weym., *Lobobunaea phaedusa* Drury and *Imbrasia eblis* Streck., as well as three unidentified species of *Nudaurelia* and one species, which died as a pupa, of which the genus could not be determined. In all these the last larval skin is shed in a very peculiar and characteristic manner. A long dorsal slit is made, reaching from the head to the 6th or 7th somite, and the pupa somehow or other (I have never been lucky enough to see the actual change) wriggles its way out, leaving the extended skin lying beside it. The skin is never worked down the body and cast off as a crumpled pellet as in most other larvae.

The usual habit of these larvae is to form a cell under the soil by pressure only, I have never found any trace of any silken threads, and in dry, sandy soil the cell often collapses so that the pupating larva is in contact with the soil all round. It is only in such cases that I have found the pupa enclosed in the larval skin, in damp, clay soil, where there has been a definite cell, or where the pupating larva has been dug up and made to complete the change on the surface of the soil, the skin is shed as described above, and I am of the opinion that the phenomenon to which Dr. Kettlewell draws attention is due to the pressure of the surrounding soil on the larva at the time of change. As Dr. Kettlewell remarks, the enclosing larval skin would prove a valuable aid to prevent desiccation, and it would also protect the newly formed

and delicate pupa from abrasion and injury through particles of soil coming into direct contact with it.

Whilst on the subject of these subterranean Saturniid pupae, it is perhaps worth recording that the small, paired, scar-like marks on the meso- and meta-thorax are black on the newly formed pupa and contrast strongly with the ivory colour of the rest of it. The small paired knobs on the pro-thorax, however, are coloured the same as the rest of the pupa and darken with it.—D. G. SEVASTOPULO, Kampala. 22.v.53.

LIBERATING MARKED BUTTERFLIES.—For many years I have been breeding thousands of *Vanessa io* L. and *A. urticae* L. with a view to obtaining information as to the travel of these insects when released. Various experiments were conducted last year in marking the liberated butterflies with spirit paint, cellulose thinned with amyl acetate, etc. However, none of the methods employed produced satisfactory results; either the paint took too long to dry, in which case the wings stuck together when the insects shut them, or else the paint was too heavy and impeded flight; in other cases the marking could not be easily seen. This year it is hoped to breed even more *V. io* and *A. urticae* for continuing the experiments, and I have found what I believe to be a much better and more practicable method of marking. For this purpose I am using gold lacquer thinned down a little. It is easy to apply with a small camel hair brush, making a smear or splash of gold on the wing. It dries instantly, will not rub off, will not impede flight, and above all is readily and easily seen; in fact it even attracts attention when the insect sits sunning itself on flowers and can be detected by an observer when cycling or passing by in a bus. The marking is also noticeable when the insect is on the wing. So far, all the specimens I have marked and released have a splash of gold on the right forewing.

At 12.30 p.m. on 25th June I marked and released 50 *V. io* at Clarendon, Wiltshire. At 10 a.m. on 26th June one was seen sunning itself at King Manor, approximately $1\frac{1}{2}$ miles distant. A little later in the day one was returned to me from Pitton, about 3 miles distant, in both cases due east from the point of release. Fifty more were liberated on 26th June at mid-day, and the same evening one was seen north of Salisbury, about 2 miles N.E. from the point of release. I use a slightly different mark for each day of release and no doubt I shall soon have to resort to markings on the hindwings or on all wings. However, it seems as though the experimental stages will yield some interesting results later on, especially when the 90 which are now pupating begin to emerge. It is proposed to mark thousands of specimens during the next few weeks and as it is possible that many of them will travel far and wide I shall be very grateful to hear from anyone who has seen or caught any of these marked butterflies, with date and place of capture.—C. M. R. PITMAN, 'Malvern', Southampton Road, Clarendon, Salisbury, Wilts. 30.vi.53.

COMMITTEE FOR THE PROTECTION OF BRITISH INSECTS.—Two matters of general interest were discussed at the last meeting of this Committee. It appears that the Conservators of Oxshott Heath are finding it difficult to discharge their duties because of the smallness of the funds at

their disposal. There can hardly be a London collector who has not visited Oxshott Heath. Most of them, like the writer, will have wondered whose responsibility it was to look after the area, and where the money came from. Apparently the Conservators rely entirely upon voluntary contributions from local residents. The Treasurer to the Conservators is Mr. G. Roy Symmons, Birds Hill Farm, Warren Lane, Oxshott, Surrey, and it is known that he would gladly accept offerings from entomologists and others who have enjoyed the amenities over which he watches. The other matter concerns access to Forestry Commission property. The Committee is often asked by entomologists why they cannot be issued with general permits allowing entry to all Forestry Commission property. This, it appears, is not possible because entry is controlled by the Area Conservators and not by the Headquarters of the Commission. The Commission's policy is to welcome genuine naturalists, but, because conditions vary so much from place to place and from time to time, a close control is essential. Fuller particulars are being circulated by the Royal Entomological Society of London in their *Proceedings, Series C.*—N. D. RILEY. June 1953.

AN ERRATUM.—Colonel W. Bowater has called my attention to some errors in my account of *Gonodontis bidentata* Clerck ab. *bowateri* (*Ent. Rec.*, 1952, 64: 334). He says that no melanic *bidentata* with a buff border have ever been bred from larvae beaten at Cannock Chase. The form was not known in 1915 and his stock did not originate from a specimen bred from a larva beaten there by Mr. Manly in 1949. I do not know how this misunderstanding occurred. After a long conversation with him I altered my account of the origin of the aberration and he now says it was quite correct. The aberration with the buff border appeared for the first time in the offspring of a cross between a melanic specimen, ab. *nigra* Prout, from Cannock Chase and a normal *bidentata* from Torquay. In the first generation the border was ill-developed and only affected some individuals. Either it was a new mutant or the buff border was introduced by the *bidentata* from Torquay, in which it would be very inconspicuous. The latter explanation of its origin seems to be the more probable. The available evidence points to its being dominant.—E. A. COCKAYNE.

Collecting Notes

RARITIES IN TILGATE FOREST.—On 10th June in Tilgate Forest, Kent, a *Celerio livornica* Esp. came to the mercury vapour lamp soon after 11 p.m. In addition to this, four *Harpyia bicuspis* Bork. arrived, the first at 11.15 and the last just before midnight. No *Tethea fluctuosa* Hüb. put in an appearance, but was plentiful on the night of the 12th in another part of the forest. Three more *bicuspis* also came in. All the *bicuspis* were very fresh, as were also most of the *fluctuosa*. Other insects included two *Hyloicus pinastri* L., several *Apatele alni* L. and *Stauropus fagi* L., with many *Hapalotis venustula* Hüb. One hundred and thirty species were noted during the two nights.—W. REID, 6 Whirlow Park Road, Sheffield, 11. 16.vi.53.

COLLECTING IN EAST HERTFORDSHIRE.—My m.v. light trap has been used from 25th March to 14th June with the exception of about six nights when I was away from home. The garden, about an acre in extent, is rather enclosed by trees and hedges, and the light is, therefore, not much spread; but the trap gives a fair idea of the local moths present. Species and numbers are as follows:—

Orthosia gothica L. (221), *O. incerta* Hufn. (135), *O. stabilis* Schf. (85), and *Lycia hirtaria* Cl. (57) were the commonest moths in the first six weeks. *Xylocampa areola* Esp. (19), *O. cruda* Schf. (18) and *Cerastis rubricosa* Schf. (15) came next in numbers. *O. gracilis* Schf. (13) appears to be a commoner moth in the district than I had thought as I had taken only one specimen in previous years. *O. munda* Schf. appeared only once although it is fairly common at Hatfield Forest, five miles away. *Drymonia ruficornis* Hufn. came twice, on 28th April and 25th May.

In the remaining period from about the middle of May the late spring moths appeared. *Agrotis exclamationis* L. (150), *Apamea obscura* Haw. (53) and *Spilosoma lubricipeda* L. (37) are the commoner moths still flying (14th June). *Hadena w-latinum* Hufn. (*genistae* Bork.), *Stauropus fagi* L., *Drepana binaria* Hufn. and *Heliophobus anceps* Schf. (*saponariae* Bork., *reticulata* Vill.) have occurred singly; the last-named is very rare in this district.

During the above-mentioned period there have been 1,011 moths of 67 species in the trap, an average of 14 moths per night. On only one night was there none, and 89 on the night of 13th/14th June was the largest number. This, of course, is very small compared with the numbers taken by other collectors, as I understand that over 1,000 moths have been taken in one night. A very few of those taken have been set; the remainder is released each day about half a mile away. No killing agent is used in the trap.

The nomenclature used is that contained in Allan's *Larval Food-plants*.—CLIFFORD CRAUFURD, Galloway Road, Bishop's Stortford. 14.vi.53.

A NOTE FROM DORSET.—I have not come across much in the moth line down here this year; only 4 larvae of *Ptilophora plumigera* Schf. in Cranborne Chase. I took a very nice var. of *Euphydryas aurinia* Rott. on Hod Hill, the best I have seen alive. I was glad to see there were plenty of *Lysandra bellargus* Rott. up there this year: they were very scarce in 1952. I did not see any unusual forms. Anyhow, the excavations of the archaeologists on the hill top have not had any bad effect on the local *Lepidoptera*.—H. SYMES, 52 Lowther Road, Bournemouth. 15.vi.53.

THE M.V. LAMP IN EAST AFRICA.—My mercury vapour lamp is a great success. Unfortunately, it is now attracting quantities of unpleasant water Hemiptera, including the very large *Belastoma*. I have a sneaking fear that one day one of these will fall on my slippered foot and bite. The other day a small Pyralid, *Marasmia trapezalis*, was in such numbers that I do not think you could have put a tumbler anywhere on about twelve square feet of wall without enclosing six or seven.—D. G. SEVASTOPULO, Kampala, Uganda. 27.iv.53.

ORTHOPTERA

'Burnt' Grasshoppers

By MALCOLM BURR, D.Sc., F.R.E.S.

A good many years ago I spent a couple of years in equatorial Africa, in the interior of Angola, the Belgian Congo and Northern Rhodesia, when I could not help noticing the famous custom of burning the grass in the dry season. The consequences are wide areas covered with burnt grass and the place is dirty with soot. It is astonishing how the grasshoppers adapt themselves to this unnatural environment. This was particularly the case with three little species of Truvalids. As is customary in the savannah country, these were slim, elongated creatures, and pale yellowish in colour, matching excellently with the dried grass before it is burnt.

But after the burning they sympathise with the grass, and become, as it were, charred. In three species this was particularly noticeable. In one, the apices of the elongated head, tibiae and fore part of the body turned blackish, and in another it was at the posterior end, the hind legs and tips of the elytra and wings. I am under the impression that both of these were of new genera, the description of which is likely to appear shortly. The third species, however, was not merely singed at the tips, but burnt black all over. This was *Glyphoclonus miripennis* Karsch. When I first saw it, I was walking through a burnt patch and my boots scattered, it seem to me, sparks and flashes of fire, which kept vanishing. Then I found to my astonishment that there was no fire, but numbers of this jet black grasshopper, with brilliant crimson wings, the famous "flash colouration" in *excelsis*. At another place afterwards I found a different form of the same species with fiery-orange wings.

When the first rains came, springs of green would appear among the black and, as a rule, there was a basis of unburnt grass near the ground itself, thus giving three colours. It was the persistence of the original buff at the base of the grass itself, contrasting with the sooty black of the burnt upper part, that made the resemblance of the two first mentioned kinds so remarkable. But when there was an occasional spot of green, to my amazement I found some specimens with a green stripe down the suture of the elytra.

I never ceased marvelling at this extraordinary phenomenon and wrote home about it to Sir Edward Poulton, who sent me out a copy of a short paper on the subject that he had published. In the Congo, in forest country, I did not see anything like it, but in Northern Rhodesia I was in the bush, and one afternoon I had to pitch camp among some rattling dry grass. To clear the ground I burnt it out. Before doing so I took care to collect a few of the grasshoppers in it and they were all buff. I watched with curiosity to see if I could find any scorched ones before leaving that spot, where I stayed only a few days, and, sure enough, there they were.

This was all in the years 1927 and 1928. Luckily, I wrote up my impressions while they were fresh, and most of them are in my Field Notes from Angola that came out in the *Ent. Record* at the time, and also in reminiscences published in a little book, *A Fossicker in Angola*,

published in 1933. Unfortunately my original notes were burnt during the war and the publisher's stocks of the book were bombed, and, living abroad with restricted library facilities, I cannot give references.

My object in reviving these fascinating memories is to call attention to a recent paper by Dr. Saadet Ergene, who is persevering with her experiments on the coloration of Orthoptera, to which references have appeared from time to time in these pages. In the *Zool. Jahrbücher*, Bd. 81, Heft 5/6, March/53, there is a brief paper by her entitled *Homochromer Farbwechsel ohne Häutung bei Heuschrecken auf schwarzem Untergrund*, in which she describes how specimens of two common grasshoppers, *Oedipoda caerulescens* and *Acrida turrita*, were put into cages painted black inside and covered with black material. The insects were adult and of the natural pale colour. Here again I am obliged to use the word "astonishing", for she found that *all* turned black in a few days. A control experiment at the same time in ordinary cages showed no change. The change occurred only when they were in the garden during the day, exposed to the sun. Specimens put in a dark room did not change. Amputated elytra placed alongside the owners did not change. The change in some cases was complete in two days and the longest period was seven. Another surprising thing was that specimens blinded by having their eyes painted with black varnish also turned black.

So we are forced to the conclusion that it is not only the immature nymphs that are subject to these changes and that it does not operate through the eyes, as believed, but by direct reaction of the integument.

It will be remembered that in the *Proc. R. ent. Soc.* in 1944 and 1951 there have been further field observations on this point by Dr. Burt and Dr. Uvarov.

COLEOPTERA

The Coleoptera of a Suburban Garden

5—Clavicornia (Part 1)

By A. A. ALLEN, B.Sc., A.R.C.S.

(Continued from Vol. 64, page 93).

The 'Clavicornia' are a very artificial group of families, and for convenience of treatment the name is here used in the old sense as excluding the Palpicornia, 'Serricornia', and Heteromera (already dealt with) and the Brachelytra which will form the last section of the list proper.

SILPHIDAE.

Necrophorus humator Gled.—Has occurred only once (June or July 1949), in some numbers under vegetable compost in a very putrid liquescent state; its non-appearance at the carrion put down during summer since 1952 is difficult to explain.

**Necrophorus interruptus* Steph.—A female example was found buried in the soil under rotten fish placed as a trap, when in a rather dry condition. 18.vii.52.

Thanatophilus sinuatus F.—First noticed with *N. humator* above, and common almost continuously from early summer to autumn at

carriion (mostly fish) since this was put down in 1952; at times in great profusion, also the larvae which quickly feed up; pupae not found, presumably deeply buried. The active stages seem to pass far more of their time hidden in the loose surface soil, or under any available cover around the bait, than in direct contact with it; they may feed to some extent on maggots and other larvae present, but this has not been proved. Latest date noted for adults 21.x; larval peak-periods about the end of May and beginning of September. (According to the books *T. rugosus* L. should be commoner than this species, but in my experience the reverse is the case at least in the south-east.)

CHOLEVIDAE.

**Parabathyscia wollastoni* Jans.—One specimen of this elusive little subterranean species under dead grass on a flower-bed, 8.vii.52; and another likewise in nearly the same spot, 11.viii.52. (Usually recorded as taken in old seed-potatoes, and doubtless much overlooked.)

Ptomaphagus subvillosus Goeze (= *sericeus* F.).—Not common, but a moderate number have occurred in the last few years at carriion, and odd ones by sweeping, on the wing, running in the sun, and under rubbish; spring to autumn; small specimens with the male post-tibial character undeveloped predominate.

Catops fuliginosus Er.—Three examples by shaking a pile of rotting cabbage stalks, 21.v.53.

Catops chrysomeloides Panz.—Occasional in 1951-2, in decaying vegetation and singly in moss, at grass roots, and at carriion, in summer.

Catops fumatus Spence.—One in earth under decomposing fish, 28.ix.52.

Catops watsoni Spence.—Rare; singly by sweeping, especially towards evening, May to August, 1951 onwards.

LEIODIDAE.

Cyrtusa pauxilla Schm.—During June and July of last year this species turned up in small numbers by evening sweeping on a lawn, chiefly near a beech hedge and under limes and other trees overhanging from the next garden; it was not to be found later in the season, nor elsewhere, but will probably recur this year. (Doubtless breeds in underground fungi, like most of the Leiodini; a few other small species may well await discovery in the garden.)

CLAMBIDAE.

Clambus minutus Stm.—In vegetable refuse of various kinds; of irregular occurrence ever since the spring of 1933, several specimens being nearly always found at a time, with long intervals between—months or years—in which it is not met with; two by sweeping, 8.vi.53. (I do not regard this species as rare compared with the next, as Fowler and Joy do.)

Clambus pubescens Redt.—In the same situations, and taken with *C. minutus* in April 1933 and later occasions up to the present, but decidedly scarcer.

SCYDMAENIDAE.

**Eutheia schaumii* Kies.—Single males taken last year by brushing the foliage of pear trees along a wall on warm evenings, 14.viii and 22.ix; both specimens very active and volatile. This uncommon species ap-

pears to breed in decaying vegetable matter, and had not previously been recorded from the London suburbs (cf. *Ent. mon. Mag.* 1952, **88**: 260).

Scydmaenus tarsatus Müll.—In heaps of cut grass and other rotting herbage, compost, etc.; not uncommon and sometimes in numbers, at intervals throughout the year in all seasons since such habitats were worked; occasionally by sweeping near its breeding-grounds.

PSELAPHIDAE.

Euplectus sanguineus Den.—As for the last species, except that it was lost sight of for a long period (about 1934-47); one also in a polypore fungus on the remains of a marrow-bed, 13.vii.51.

Euplectus signatus Rchb.—Very rare; one example only in well-rotted grass in March, 1950.

Tychus niger Payk.—Taken singly since last autumn as follows: by general sweeping, 16.ix.52; under dry rubbish, 5.x.52; sweeping lush grass beneath apple trees, 20 and 22.v.53.

PTILIIDAE.

Unlike any of those preceding, this family (especially the genus *Acrotrichis*) is well represented in the garden fauna; but owing to their minute size the smaller species must be continually overlooked. The main habitat here is more or less the same for all, viz., decaying plant material such as grass-heaps, and need not be repeated for the various species. Few but the commonest seem to have been recorded from nearer London than Tonbridge—which shows how most collectors regard (or disregard) the family! They can be found during the greater part of the year.

Ptenidium pusillum Gyll. (= *evanescens* Marsh.).—General, and as a rule abundant, sometimes in great profusion; the commonest of the genus everywhere in my experience.

Ptenidium nitidum Heer.—Much less often seen, but when it is, usually in colonies and not intimately mixed with *P. pusillum*. (Two or three other species are likely to be found eventually.)

Millidium minutissimum Lj.—A few specimens at wide intervals of time from 1937 to 41 only. It seems scarce in the south-east.

Ptilium exaratum Allib.—Not uncommon at times, but rather erratic.

Ptiliolum spencei Allib.—Somewhat more plentiful and of more regular occurrence; occasionally also taken by sweeping.

Ptiliolum kunzei Heer.—Seemingly not at all common, but easily passed over with *N. titan* in the field; odd specimens have been noted since the autumn of 1937 when the garden was first worked for *Ptiliidae*.

Oligella foveolata Allib.—Very rare apparently, four specimens having been taken on 9.x.37 and none since; like all the above, in a pile of cut grass.

Nephanes titan Newm.—Tolerably common at intervals, usually in company with some of the preceding and succeeding species.

Acrotrichis grandicollis Mann.—Not infrequent, though it tends to occur singly; has also been captured on the wing and by beating, etc.

Acrotrichis fascicularis Hbst.—Easily the commonest of the genus in the garden; can be found at almost any time, often in quantity; has also occurred in moss, in a heap of twigs and sticks, dead leaves and

mouldy fruit, on foliage, and flying. I have an example of the var. *laetitia* Matth. from cut grass in the garden, dated 23.iii.38; this form may prove a distinct species, as originally described. (The allied and supposedly common *A. intermedia* Gillm. (= *lata* Brit. auct.) has been sought in vain.)

Acrotrichis atomaria Deg.—Much less abundant than the last, but not rare; it occurred copiously on a damp asphalt surface under turf, June 1952.

**Acrotrichus championi* Matth. (= *thoracica* Matth., Joy, nec Waltl.).—Very scarce, unless confused with the last, which it closely approaches; the only certain specimen is dated 23.x.37. (This is the species shaped like *atomaria*, the thorax still more remotely tuberculate and scarcely reticulate, and long yellow antennae with longer third joint.)

**Acrotrichis thoracica* Waltl (= *anthracina* Matth., Joy).—Three examples on different days in October 1937 are all that have been noted so far. (In the tangled synonymy of the two latter species I here follow Kloet and Hincks (1945) who differ from Britten and Joy—see Joy, 1932, *Pract. Handb. Brit. Beetles*, I: 571. The present species is broad and subparallel with a shining diffusely tuberculate thorax which is but little wider than the elytra, and short dark antennae.)

Acrotrichis montandonii Allib.—In some numbers at times, chiefly in past years; occasionally in moss or by sweeping.

**Acrotrichis brevis* Mots.—A single specimen from siftings of cut grass, 22.vi.39, must apparently be referred to this very rare species.

Acrotrichis sericans Heer.—Hardly common and never found freely, but less erratic in incidence than several of the species.

Acrotrichis bovina Mots.—Scarce and always found singly; April 1946 and subsequently; one caught flying over grass heap, 11.v.53.

Acrotrichis brevipennis Er.—Equally sporadic; first taken 1.iv.41, and one or two more since.

**Acrotrichis longicornis* Mann.—Another very rare species, of which a male was obtained from rotted-down grass, 23.iii.38.

HISTERIDAE.

Except where otherwise stated, these inhabit well-decayed vegetable refuse. They apparently hibernate as adults.

Onthophilus striatus Forst.—Rather sparing as a rule, but found at frequent intervals since about 1930.

Acritus nigricornis Hoff.—Not often met with, but when it is, generally a number are found; two in a small fungus, March 1949; one swept off long grass, 14.viii.52. First observed about 1938.

Saprinus semistriatus Scrb. (= *nitidulus* F.).—So far only seen in 1952, when it occurred in varying numbers with the next species in June and July, more rarely later in the season (latest 4.ix).

Saprinus aeneus F.—Sometimes numerous under rotting fish and dead birds, May to September, 1952-3.

**Carcinops 14-striata* Steph.—Taken very sparsely and at rather long intervals, chiefly early spring, from iii.35; not seen in the last few years.

Hister unicolor L.—Found almost every year since 1927 in which grass and compost have been worked, but can hardly be called really common.

Also in a pile of rotten apples in autumn, and very exceptionally at carrion. (Elsewhere also in dung.)

Hister cadaverinus Hoff.—Common at carrion, and very often found buried in the soil beneath like the Saprini and indeed most of the necrophagous species; also sometimes in putrid vegetable matter, but the general habitat of this species and the last are markedly different—a fact not usually recognized. *Cadaverinus* is slightly the more catholic in its tastes but I have never taken it in dung.

(*)*Hister merdarius* Hoff.—Frequent at certain periods since first detected in 1933, though at others not seen at all (e.g., the last six years or more up to the end of this May, after which it has suddenly reappeared in force); has sometimes been the commonest *Hister* in the garden. This and the two preceding species occurred together in semi-liquid grass-mulch, 30.v.53. The natural death of a specimen was witnessed recently: found under a tile at the foot of the house wall, in worn but seemingly still vigorous condition, it was taken for identity-check and released from the study-window; next day it was seen to be back in the very same spot (the tile was one of a whole row, almost under the said window, serving as beetle-traps), and for three days more was left undisturbed, but on the next was found to be dead. The species occurs also in birds' nests elsewhere, and is not nearly as rare as the books suggest.

Hister purpurascens Hbst.—Taken singly, and only three times so far: in rotting herbage, 11.v.46 (ab. *niger* Er.); and twice by grubbing amongst grass on a flower-bed, 9 and 22.iv.53 (typical form).

Hister 12-striatus Schrk.—Somewhat common as a rule; has been found in mid-winter in compost-heaps; one at roots of grass, 15.iv.51.

Hister bimaculatus L.—This pretty little species seems very rare here, a single example only having occurred as long ago as August 1930.

NITIDULIDAE.

Brachypterus glaber Steph.—By sweeping; 4.vi.51, 8.viii.52.

Brachypterus urticae F.—Also swept up, 27.vi. 50. The single specimens encountered are evidently strays, as the food-plant of both species is nettle which is not present in the garden.

Brachypterus pulicarius L.—One swept from weeds, 5.vi.51; another from lilac bloom, 26.v.53. Its foodplant, toadflax, again is not found in the garden.

**Brachypterus vestitus* Kies.—On pear blossom; odd specimens beaten from other flowers (*Pyracanthus*, lilac, etc.) and by general sweeping; one at roots of chickweed on cinder path; April to June; by no means rare. Found first in 1944 (see *Ent. mon. Mag.*, 1945, 81: 77). First recorded in Britain as damaging antirrhinums at Cambridge, but has since become naturalized in the wild. I could never find a trace of it on the few antirrhinums in this garden.

Luria (= *Pria*) *dulcamarae* Scop.—A few examples taken last summer by general beating and sweeping; it will probably increase now that *Solanum dulcamara* is thoroughly established in the garden.

Meligethes flavimanus Steph. (= *lumbaris* Stm.).—Apparently a recent arrival, two or three specimens having occurred at flowers of lilac and weigelia and one by sweeping, in late May and early June of this year.

Meligethes aeneus F.—Common, but not abundant, from spring to autumn on buttercups, lilac, fruit trees in flower, etc.; one at roots of grass, 9.iv.53. Its breeding-plants are Cruciferae, especially charlock—not found in the garden.

Meligethes viridescens F.—Unaccountably rare; one off lilac bloom, 26.v.53, is the sole record.

Meligethes nigrescens Steph. (= *picipes* Stm.).—Only in the last two years: twice by sweeping, July-August 1952; several by beating flowers of the kinds mentioned above, May-June 1953. If it breeds in the garden, it probably does so on clover.

Meligethes flavipes Stm.—As soon as its host, *Ballota nigra*, was noticed in the garden in 1949 a look-out was kept for the beetle, which first turned up on 13.vii.51 (two examples swept from the plant). More frequent since that time, on and off from spring to autumn, by sweeping and on thistle and other flowers, often far from any *Ballota*.

**Meligethes incanus* Stm.—Since first taken in 1951, has occurred on many occasions (sometimes two or three individuals together) between spring and autumn but mostly in July and August, on such flowers as globe-thistle (*Echinops*), wild thistle, golden-rod, yarrow, and aster; and even by sweeping near the flower-beds. It breeds on catmint, which is absent from the garden; and appears to have been almost invariably mistaken in Britain for *M. umbrosus* Stm.—indeed there was only one specimen on record before Dr. A. M. Easton, the specialist in this genus, cleared up the confusion.

Meligethes erythropus Gyll.—Fairly general, but never numerous, throughout the summer on a variety of blossoms and by sweeping; like most of the species, noted only in recent years. (This is probably due as much to reduced cultivation of the garden as to intensified collecting! The breeding-plant of this species, according to Dr. Easton, is *Lotus*—which has not yet been observed to grow there.)

**Nitidula carnaria* Schal. (= *4-pustulata* F.).—A solitary example in the earth under the remains of decomposed fish, 25.vii.53.

Omosita discoidea F.—Common; in profusion in and under old bones in spring, under dry carrion in summer, and in plenty with the next species under rotten mouldy plums in autumn; odd specimens in vegetable refuse, and by sweeping in warm weather (e.g. 25.iii.53).

Omosita colon L.—In the same situations as *discoidea*, but less generally common, except perhaps in the last few years; plentiful under carcase of starling, v.53, unaccompanied by the other species; the two were equally abundant under mouldy plums in Sept.-Oct. 1952, a few individuals of both lingering on until well into December. First taken in a compost heap in 1948.

Epuraea aestiva L.—From April to August on flowering shrubs or trees, but chiefly in May and the first half of June; on lilac and weigelia in large numbers; two very small specimens from golden-rod, 14.ix.51; a few swept under apple trees long after the blossom was over, various dates, viii.52; one at grass roots, 19.iv.51.

Epuraea florea Er.—In late August, 1951, a few rather large specimens were brushed from flowers of golden-rod, hollyhock and globe-thistle, but it was not found the following year.

Epuraea heeri Tourn. (= *x-rubrum* J. Sahl., *unicolor* and *obsoleta* Brit. cat.).—An example of this long-expected species was found under orange-peel put down as a trap, 6.v.53.

Soronia grisea L.—Two shaken out of rotting dahlia roots, iv.33; it is surprising that no more have occurred, as so many saprophagous species have turned up in the last few years.

(To be continued)

DIPTERA

Notes on the Emergences of Trypetidae

By M. NIBLETT, F.R.E.S.

During my extensive breeding of Trypetid flies from their larvae a number of observations on their emergences have been made, a summary of which may be of some interest.

GALL-CAUSING SPECIES.

With some exceptions to which I will refer later the larvae overwinter in the galls in which they eventually pupate, the flies emerging in June and July of the second year.

Urophora cardui L. in stem galls on *Cirsium arvense*; *U. stylata* F. in flower-heads of *Cirsium vulgare*; *U. cuspidata* in flower-heads of *Centaurea scabiosa*; *U. jaceana* Her. in flower-heads of *Centaurea nigra*; and *Myopites blotii* Bréb. in those of *Pulicaria dysenterica* all do this. An exception is *Sphenella marginata* Fln. whose larvae live and pupate in flower-heads of various species of *Senecio*, the flies emerging in August and September of the same year and hibernating.

There are two species where the time taken to reach maturity must be very short, they are *Oxya flavipennis* Lw. whose larvae cause galls on the roots of *Achillea millefolium* from which the flies emerge in July; I have found these galls from August to March and in every case they contained empty puparia, flies emerging only from galls found in June; and *Paroxya misella* Lw. whose larvae cause galls on shoots of *Artemisia vulgaris*, these galls may be found in June and July, the flies emerging in July of the same year.

STEM-FEEDING SPECIES.

The larvae of *Ceriocera microceras* Her. live in stems of *Centaurea scabiosa* and pupate there, the flies emerging in July of the second year; those of *Oxya parietina* L. do the same in stems of *Artemisia vulgaris* but the flies emerge in the following May; the larvae of *Trypeta falcata* Scop. live at first in the roots of *Tragopogon* spp. and work up into the stems to pupate, the flies emerging in May and June of the second year.

LEAF-MINING SPECIES.

These larvae all leave the mines when full-fed to pupate in the earth. They are *Spilographa zoë* Mg. in mines on *Artemisia*, *Chrysanthemum*, and *Senecio*, the larvae may be found in June and July, the flies emerge in July and August of the same year, hibernating as adults; the larvae of *Philophylla heraclei* L. which live in the leaves of various species of Umbelliferae behave in the same manner, the flies emerge in July and

August and also hibernate; the larvae of *Acidia cognata* Wied. are found in mines in leaves of *Petasites ovatus* and *Tussilago farfara* in late autumn, they overwinter and the flies emerge in June of the following year.

FRUIT-FEEDING SPECIES.

We have few of these in Britain and the larvae all leave the fruits in the autumn to pupate in the earth.

The larvae of *Gonioglossum wiedemanni* Lw. are to be found on *Bryonia dioica* in the late summer and the flies emerge in the following May and June; the larvae of *Phagocarpus permundus* Har. on *Crataegus* and *Pyracantha* spp. may be found in September and October, the flies emerging in May and June of the year following; *Zonosema alternata* Fln. with larvae on *Rosa* spp. in September and October, has the flies emerge in May and June of the following year.

FLOWER-HEAD SPECIES.

The larvae of a large proportion of our Trypetidae inhabit flower-heads of the Compositae. Some species are single-brooded, other double-brooded, while some have retarded emergences, a portion of a brood emerging in the first year and the remainder overwintering as larvae, with the flies coming out in the second year. I will deal with them in that order.

Single-brooded Species:—*Urophora spoliata* Hal. on *Serratula tinctoria*, has the flies emerge in June and July of the second year; *Ceriocera cornuta* F. on *Centaurea scabiosa*, I have had a few flies of this species emerge in August and September of the first year but have not yet sufficient evidence to class it as a double-brooded species, the main emergence is in June of the second year. *Terellia longicauda* Mg. on *Cirsium eriophorus* has the flies emerge in June and July of the second year, as do also those of *T. serratulae* L. from *Carduus nutans* and *Cirsium vulgare*; *Trypeta ruficauda* F. with larvae in heads of *Cirsium arvense*, *C. palustre* and *C. pratense*; *T. winthemi* Mg. in *Carduus crispus*, and *T. vectensis* Col. in *Serratula tinctoria*, all pupate in the heads; and *T. tussilaginis* F. whose larvae live and pupate in the achenes of *Arctium* spp., are all species whose larvae overwinter, the flies emerging in June and July of the second year.

Larvae of *Paroxyna elongatula* Lw. pupate in flower-heads of *Bidens tripartita*, the flies emerging in August and September of the first year and hibernating; *P. plantaginis* Hal. has larvae on *Aster tripolium* which pupate in the heads, the flies emerge in June and July of second year; *Tephritis bardanae* Schr. on *Arctium* spp. has the larvae pupate in the heads, with the flies emerging in August and September of the first year; *T. conjuncta* Lw. on *Chrysanthemum leucanthemum* emerges in June and July of the first year; *T. hyoscyami* L. on *Carduus crispus* emerges in July and August of the first year; *Trypanea stellata* Fuess. has larvae in *Hieracium* spp. and *Senecio* spp., the flies emerging in August and September of the first year.

Double-brooded Species:—It is rather difficult to decide with some species as to whether they have two broods or not, with those mentioned below there is no doubt of this being the case.

Chaetostomella onotrophes Lw. whose larvae are found in flower-heads of *Centaurea nigra*, *Cirsium arvense*, *C. palustre* and *Serratula*

tinctoria, has the flies from overwintering larvae emerging in April, May, June, and occasionally July, these giving rise to a second brood in July and August; *Chaetorellia loricata* Rond. in flower-heads of *Centaurea scabiosa* emerges from overwintering larvae in June, and is followed by a second brood in July and August; *Trypeta colon* Mg. with larvae in flower-heads of *Centaurea scabiosa*, has the first brood emerge in June and July, the second brood emerging in August; *Hoplochaeta pupillata* F. has rather erratic emergences, these from overwintering larvae take place in May and June, from July to September another brood, or broods, will emerge. It is not an uncommon thing to find both larvae and empty puparia in the same swollen flower-head of a *Hieracium* sp. in which they feed and pupate; *Xyphosia miliaria* Schrnk. larvae live and pupate in flowers of *Cirsium arvense* and *C. palustre*, flies from overwintering larvae emerge from May to July, a second brood emerges in August and September; *Urophora quadrifasciata* Mg. larvae live and pupate in the achenes of *Centaurea nigra*, here again we have two broods, flies from the overwintering larvae emerge in May, June and July; flies from the second brood in July and August.

I feel it safe to assume that *Tephritis vespertina* Lw. is a double-brooded species, I have found larvae in heads of *Hypochoeris radicata* in May, from which flies emerged two weeks later, and other larvae and pupae up to the end of July, flies from the late pupae emerging in July and August and undoubtedly hibernating. The larvae and pupae of *Ensina sonchi* L. may be found in flower-heads of various species of Compositae from May to August, the flies emerging from June to September; with this and the previous species there is probably a succession of broods.

Retarded Emergences:—With *Chaetostomella onotrophes* Lw. I have had few instances, a portion of a brood emerging in August and the remainder in the following June; with *Ceriocera cornuta* F. on several occasions from July collected larvae a portion of the brood has emerged in September, the remainder coming out in June and July of the following year; with *Trypeta colon* Mg. I have had a number of instances where a portion of a brood has emerged in July and August, with a further emergence in June of the following year; *Hoplochaeta pupillata* F., I have had numerous flies of this species emerge in July and August, and a considerable emergence in the following May; *Xyphosia miliaria* Schrnk. from July larvae on several occasions have emerged in August and September, and again a number from May to July of the following year; with *Urophora quadrifasciata* Mg. a number of series have given a considerable emergence in July and August, with about an equal number emerging in the following May and June; the larvae of *Myopites frauenfeldi* Schin. cause galls in flower-heads of *Inula crithmoides*, flies have emerged in August and September, followed by a good number in June and July of the next year.

I have only dealt with species of which I have had considerable numbers of their larvae, it is necessary to collect large numbers over as wide a period as possible, to obtain correct details of the emergence times of the flies.

The above notes refer to 4150 Trypetids bred from a very much larger number of their larvae that were collected.

The Hover-flies (*Syrphidae*)

By L. PARMENTER, F.R.E.S.

(Continued from page 190).

LITERATURE.

- The selected list below includes several that mention many more papers on the family. It also includes items relating to additions to the British List since the publication of Kloet and Hincks' Check List.
- Allen, A. A. 1947. Aggressive Behaviour of a *Syrphus* (Dipt.). *Ent. mon. Mag.*, **83**: 78.
- , 1952. *Volucella inanis* L. (Syrphidae) twice found Indoors at Blackheath. *Ent. Rec.*, **64**: 299-300.
- Alsterberg, G. 1934. Beiträge zur Kenntnis der Anatomie und Biologie der limnophilen Syrphidenlarven. *Biol. Zentrbl.*, **54**: 1-20.
- Andrews, H. W. 1931, 1935, 1943, 1949. British Dipterological Literature. I-IV. *Ent. Rec.*, **43**, **47**, **55** and **61**.
- , 1948. *Rhingia campestris* Mg., and *Syrphus balteatus* De Geer. *Ent. Rec.*, **60**: 107.
- Aubertin, D., and Diver, C. 1933. *Triglyphus primus* Lw. (Syrphidae) taken in London. *Ent. mon. Mag.*, **69**: 188-189, 203.
- Audcent, H. L. F. 1949, 1950. Bristol Insect Fauna. Diptera. *Proc. Bristol Nat. Soc.*, **27**: 409-470 and **28**: 45-132.
- , 1951. Midnight flies. *Ent. mon. Mag.*, **87**: 133.
- Banks, C. J. 1951. Syrphidae (Dipt.) as pests of cucumbers. *Ent. mon. Mag.*, **87**: 239-240.
- Beling, T. 1882. Beitrag zur Metamorphose zweiflügeligen Insecten aus den Familien . . . Syrphidae. *Arch. Natur.*, **48**: 186-240.
- , 1888. Beitrag zur Metamorphose einiger zweiflügeliger Insecten aus den Familien . . . Syrphidae. *Verh. zool.-bot. Ges. Wien*, **38**: 1-4.
- Bromley, P. J. 1946. Ichneumonidae (Hym.) bred from Syrphid (Dipt.) puparia. *Ent. mon. Mag.*, **82**: 269.
- Brown, E. S. 1951. Variation and Polymorphism in *Lampetia equestris* (F.) (Dipt., Syrphidae) and other British Mimetic Insects. *Ent. mon. Mag.*, **87**: 16-18.
- Buckton, G. B. 1895. *Natural History of Eristalis tenax or the drone fly*, 1-88. London.
- Carrick, R. 1936. Experiments to test the efficiency of protective adaptations in insects. *Trans. R. ent. Soc. Lond.*, **85**: 131-140.
- Coe, R. L. 1938. Rediscovery of *Callicera yerburyi* Verrall (Diptera: Syrphidae); its breeding habits, with a description of the larva. *Ent.*, **71**: 97-102.
- , 1939. *Callicera yerburyi* Verrall (Diptera: Syrphidae), a synonym of *C. rufa* Schummel, further details of its life history, with a description of the puparium. *Ent.*, **72**: 228-231.
- , 1939. Description of the female of *Xylota xanthocnema* Collin (Dipt., Syrphidae). *Ent. mon. Mag.*, **75**: 224.
- , 1939. A second British record of *Rhingia rostrata* Linnaeus (Dipt., Syrphidae): its distinctions from *R. campestris* Meigen. *Ent. mon. Mag.*, **75**: 225-227.

- , 1941. *Chrysochamys ruficornis* F. (Dipt., Syrphidae): its distinctions from *C. cuprea* Scop. *Ent. mon. Mag.*, **77**: 165-167.
- , 1941. *Brachypalpus eunotus* Loew (Dipt., Syrphidae) new to Britain; its distinctions from *B. bimaculatus* Macquart and notes on synonymy in the genus. *Ent. mon. Mag.*, **77**: 193-197.
- , 1942. *Rhingia campestris* Meigen (Dipt., Syrphidae): an account of its life-history and descriptions of the early stages. *Ent. mon. Mag.*, **78**: 121-130.
- , 1950. *Criorrhina oxycanthae* Meig., a variety of *C. berberina* F. (Dipt., Syrphidae). *Ent. mon. Mag.*, **86**: 124-126.
- Collin, J. E. 1931. Notes on some Syrphidae. *Ent. mon. Mag.*, **67**: 153 *et al.*
- , 1937. Notes on Syrphidae (Diptera) II. *Ent. mon. Mag.*, **73**: 182-185.
- , 1939. Notes on Syrphidae (Diptera) III. *Ent. mon. Mag.*, **75**: 104-109.
- , 1940. Notes on Syrphidae (Diptera) IV. *Ent. mon. Mag.*, **76**: 150-158.
- , 1946. *Syrphus ericarum* sp. n. ♂ ♀ (Diptera, Syrphidae). *Ent. Rec.*, **58**: 117-119.
- , 1946. A redescription of *Syrphus mecogramma* Bigot, and a note on the occurrence of probably the same species in Scotland (Diptera). *Proc. R. ent. Soc. Lond. B.*, **15**: 11-12.
- , 1950. A second British species of *Myolepta* (Diptera, Syrphidae). *J. Soc. Brit. Ent.*, **3**: 133-137.
- , 1952. *Syrphus malinellus* sp. n. (Diptera, Syrphidae). *Proc. R. ent. Soc. Lond. B.*, **21**: 35-36.
- , 1952. On the Subdivisions of the Genus *Pipizella* Rnd. and an Additional British Species (Diptera, Syrphidae). *J. Soc. Brit. Ent.*, **4**: 85-88.
- Colyer, C. N., and Hammond, C. O. 1951. *Flies of the British Isles*, 1-383. London.
- Cumber, R. A. 1949. Humble-bee parasites and commensals found within a thirty mile radius of London. *Proc. R. ent. Soc. Lond. A.*, **24**: 119-127.
- Donisthorpe, H. St. J. K. 1927. *Guests of British Ants*, 1-268. London.
- Fonseca, E. C. M. d'A. 1948. Four Notes on Diptera. *Ent. Rec.*, **60**: 50-51.
- Fraser, F. C. 1946. *Volucella* (Dipt., Syrphidae) larvae sp., breeding in a nest of *Vespula vulgaris* L. (Hym., Vespidae). *Ent. mon. Mag.*, **82**: 55-57.
- , 1946. A final report on the breeding of *Volucella* (Dipt., Syrphidae) larvae in a nest of *Vespula vulgaris* L. (Hym. Vespidae). *Ent. mon. Mag.*, **82**: 158.
- Gäbler, H. 1932. Beitrag zur Kenntnis der *Eristalis* larven. *Stettin ent. Ztz.*, **93**: 143-147.
- Goffe, E. R. 1934. *Tubifera* (= *Eristalis*) *tenax* Linn. (Dipt., Syrph.) in flight in December. *J. Soc. Brit. Ent.*, **1**: 10-11.
- , 1945. Migration in the Syrphidae (Diptera). *Ent. mon. Mag.*, **81**: 61-62.

- , 1947. The wing venation of Syrphidae (Diptera). *Ent. mon. Mag.*, **83**: 225-239.
- , 1949. Some further records of *Triglyphus primus* Loew (Diptera, Syrphidae) and the finding of the larvae in Belgium. *J. Soc. Brit. Ent.*, **3**: 62-63.
- , 1949. The first genus to be proposed in Syrphidae (Diptera). *J. Soc. Brit. Ent.*, **3**: 63-64.
- , 1952. An Outline of a Revised Classification of the Syrphidae (Diptera) on Phylogenetic Lines. *Trans. Soc. Brit. Ent.*, **11**: 97-124.
- Hammer, O. 1941. Biological and ecological investigations on flies associated with pasturing cattle and their excrement. *Vidensk. Medd. Naturh. Foren.*, **105**: 141-393. Copenhagen.
- Hassan, A. A. G. 1944. The structure and mechanism of the spiracular regulatory apparatus in adult diptera and certain other groups of insects. *Trans. R. ent. Soc. Lond.*, **94**: 103-153.
- Heiss, E. M. 1938. A classification of the larvae and puparia of the Syrphidae of Illinois exclusive of aquatic forms. *Ill. Biol. Monogr.*, **16**: 1-142.
- Hennig, W. 1952. *Die Larvenformen der Dipteren*. 3 Teil. viii + 1-628. Berlin
- Hobby, B. M. 1932. Observations on the Habits and Prey of the Fossorial Wasp *Mellinus arvensis* L. *Trans. ent. Soc. S. of Eng.*, **7**: 68-80.
- , 1933. Prey of British Dragonflies. *Trans. ent. Soc. S. of Eng.*, **8**: 65-76.
- , 1933. Prey of *Scatophaga stercoraria* L. (Dipt., Cordyluridae). *J. ent. Soc. S. of Eng.*, **1**: 106-110.
- , 1940. *Pocota personata* (Harris 1776) (= *apiformis* (Schrank 1781)) (Dipt., Syrphidae): occurrences in Britain. *Ent. mon. Mag.*, **76**: 238-244.
- , 1940. Spiders and their Prey. *Ent. mon. Mag.*, **76**: 258-259.
- Hodson, W. E. H. 1927. The binomics of the lesser bulb flies, *Eumerus strigatus* Fall. and *E. tuberculatus* Rond. in south-west England. *Bull. ent. Res.*, **17**: 373-384.
- , 1931. A comparison of the immature stages of *Eumerus tuberculatus* Rond. and *Syrirta pipiens* Linne (Syrphidae). *Bull. ent. Res.*, **22**: 55-58.
- , 1932. A comparison of the larvae of *Eumerus strigatus* Flin. and *Eumerus tuberculatus* Rond. (Syrphidae). *Bull. ent. Res.*, **23**: 247-249.
- , 1932. The large narcissus fly *Merodon equestris* Fab. (Syrphidae). *Bull. ent. Res.*, **23**: 429-448.
- Ilse, D. 1949. Colour Discrimination in the Dronefly, *Eristalis tenax*. *Nature*, **163**: 255.
- Imms, A. D. 1947. *Insect Natural History*, 1-317. London.
- Kerrich, G. J. 1942. Second Review of Literature concerning British Ichneumonidae (Hym.) with notes on Palaearctic Species. *Trans. Soc. Brit. Ent.*, **8**: 43-77.
- Lack, D. and E. 1951. Migration of insects and birds through a Pyrenean Pass. *J. Anim. Ecol.*, **20**: 63-67.

- Laurence, B. R. 1945. Syrphidae, etc. (Diptera) in Bedfordshire. *Ent. mon. Mag.*, **81**: 125.
- , 1947. Aggressive Behaviour of Syrphidae (Dipt.). *Ent. mon. Mag.*, **83**: 219.
- , 1947. Behaviour of *Chrysotoxum* (Dipt., Syrphidae). *Ent. mon. Mag.*, **83**: 280.
- , 1948. Abundance and Scarcity of *Rhingia campestris* Mg. (Dipt., Syrphidae). *Ent. Rec.*, **60**: 100-101.
- Lundbeck, W. 1916. *Diptera Danica*. **5**: 18-603. Copenhagen.
- Metcalf, C. L. 1913. The Syrphidae of Ohio. *Ohio Biol. Surv. Bull.*, **1**: 9-123.
- , 1916. The Syrphidae of Maine. *Maine Agr. Exp. Sta. Bul.*, **253**: 193-264.
- Nixon, G. E. J. 1934. Two notes on the behaviour of *Volucella pellucens* in its association with the wasps *Vespa vulgaris* Linn. and *Vespa germanica* Fab. *Ent. mon. Mag.*, **70**: 17-18.
- Parmenter, L. 1944. Behaviour of *Syrpitta pipiens* L. (Dipt., Syrphidae). *Ent. mon. Mag.*, **80**: 44.
- , 1948. *Rhingia campestris* Mg. (Dipt., Syrphidae) a further note. *Ent. Rec.*, **60**: 119-120.
- , 1950. The Diptera of Bookham Common. *London Naturalist* for 1949, **29**: 98-133.
- , 1951. The number of eggs laid by a Hover fly. *Ent. Rec.*, **63**: 255.
- , 1951. The egg-laying of *Catabomba* (= *Scaeva*) *pyrastris* L. [Dipt., Syrphidae]. *Ent. Rec.*, **63**: 255.
- , 1952. Syrphidae (Dipt.) attracted to yellow colours. *Ent. mon. Mag.*, **88**: 50.
- Saunt, J. W. 1945. Migration of Syrphidae (Dipt.). *Ent. mon. Mag.*, **81**: 131.
- Scott, E. I. 1939. An account of the development stages of some aphidophagous Syrphidae (Dipt.) and their parasites (Hymenopt.). *Ann. Applied Biol.*, **26**: 509-532.
- Shillito, J. F. 1947. *Pocota personata* (Harris, M.) (Dipt., Syrphidae) from Epping Forest. *Ent. mon. Mag.*, **83**: 180-181.
- Tilden, J. W. 1952. Observations on the Habits of Certain Syrphidae (Diptera). *Ent. News*, **63**: 39-43.
- Timms, C. 1946. Hibernation of *Tubifera tenax* L. *Ent. Rec.*, **58**: 39.
- Turner, A. H. 1946. Prey of *Miseumena calycina* (Arach., Thomisidae). *Ent. Rec.*, **58**: 113-114.
- Varley, G. C. 1937. Aquatic Insect larvae which obtain oxygen from the roots of plants. *Proc. R. ent. Soc. Lond. A.*, **12**: 55-60.
- Verdcourt, B. 1948. Scarcity of *Rhingia campestris* Mg. (Dipt., Syrphidae). *Ent. Rec.*, **60**: 108.
- Verrall, G. H. 1901. *British Flies*, **5**. London.
- Wainwright, C. J. 1942. A new British Syrphid (Dipt.) *Lasiophthicus* (*Catabomba*) *albomaculata* Macq. (*gemellari* Rond.). *Ent. mon. Mag.*, **77**: 3-4.
- , 1944. *Hammerschmidtia ferruginea* Fall. (Dipt., Syrphidae) in Scotland. *Ent. mon. Mag.*, **80**: 8-9.

- , 1944. Migratory Diptera. *Ent. mon. Mag.*, **80**: 225-226.
- , 1945. *Triglyphus primus* Lw. (Dipt., Syrphidae) in Hants. *Ent. mon. Mag.*, **81**: 53-54.
- Wigglesworth, V. B. 1947. *The Principles of Insect Physiology*, 3rd edit., 1-434. London.
- Zumpt, F., and Heinz, H. 1949. Studies on the Sexual Armature of Diptera. *Ent. mon. Mag.*, **85**: 299-306
(Concluded.)

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

PAPILIO MACHAON FEEDING ON SKIMMIA SP.—Some examples of *Papilio machaon*, turned loose in Surrey, last June, laid ova on *Skimmia oblata*, a plant only introduced from China and Japan some thirty years since. Some hundred larvae were brought to me, and they all fed up greedily on the shrub in question, often, indeed, leaving carrot, which I grew at its side, to feed on it. I am trying experiments on a large scale with it this year, as I wish to find out if *P. machaon*, which I have been told feeds on *Skimmia* in Japan, though I cannot verify this statement, will vary towards its far eastern relations if fed here for some generations.—CECIL FLOERSHEIM.

CURIOUS RESTING HABIT OF MANIA MAURA.—I have recently come across a curious resting-habit of *Mania maura*. I found no less than fifteen of them in a space something under a yard square. They were "piled up," if I may use the term, in one instance seven were touching each other. In the majority of cases their heads were together, so that they were resting similarly to the way moths sometimes cluster round a spot of treacle.—MERVYN G. PALMER. 10th September 1903.

CRIOCEPHALUS POLONICUS DISCOVERED IN THE NEW FOREST.—During last year Mr. F. Gilbert Smith took some larvae of a longicorn beetle in the New Forest in Scotch fir, and, after seeing them, I decided to accompany him this year to that district to thoroughly investigate the subject, and we succeeded in finding the insect in numbers. They were all taken in the larval stage, the colony being a very strong one. Soon after arrival home they pupated and eventually emerged, and proved to be *Criocephalus polonicus* Motsch., a large longicorn beetle new to Britain. The conditions under which they were living left no doubt that they had been breeding there for many years, and it is most probable that they are to be found in other parts of the forest if worked for in places offering the right conditions.—H. WILLOUGHBY ELLIS.

Current Literature

Hr. Alfred Kernen of Stuttgart, who publishes the *Insektenboerse* and *Ent. Zeitschrift*, has sent us for review a most useful 28-page booklet for the use of collectors who visit Digne (Basses-Alpes). Originally issued as a Supplement to the *Ent. Zeits.* it is by G. Lederer and J. Leinfest and has now been translated into French by Mons. J. Propper. The price is not stated, but doubtless it is a modest one. The title is *La Faune des Papillons de Digne*. For a hundred years Digne

has been a favourite hunting-ground for lepidopterists both English and Continental, and indeed with good reason: this sheltered valley and the mountains which surround it, 150 km. N.W. of Nice, contain no less than 3 species of *Papilio*, 2 of *Thais*, 4 of *Euchloe* and *Anthocharis*, 3 of *Parnassius*, 11 Satyrids, 35 Lycaenids, 21 Hesperids, 20 Zygaenids, and 11 species of *Uatocala*.

The 'Papillons' of the title comprise moths as well as butterflies, and the authors tell us about the "good things" we are likely to attract with the lamp. All the best localities (19 in number) in the neighbourhood of Digne are described and their 'specialities' given, also where to go and when to go for both imagines and larvae, butterflies and moths. There is an account of the changes in the fauna which have taken place between 1851 and 1950 and, equally important, the modern names of the localities mentioned by writers sixty years ago. A useful bibliography of papers (which includes twelve by English collectors) on Digne and its Lepidoptera completes the work. We strongly recommend those of our readers who contemplate collecting in the South of France to procure a copy of this most useful guide. Incidentally, it contains the advertisements of seven hotels.

The issue of the first number of *The British Journal of Animal Behaviour* in January 1953 was welcomed by many naturalists. This quarterly journal is to be the regular scientific publication of the *Association for the Study of Animal Behaviour* which was founded in 1936 and until now has only produced bulletins at irregular intervals. In the present issue the only paper of special entomological interest is by C. R. Ribbands on 'The Inability of Honeybees to Communicate Colours'. The author describes an experiment which suggests that bees are unable to communicate the colours of flowers to other bees. This is contrary to the findings of Françon (*The Mind of the Bee*, 1939) whose evidence, however, was not convincing. The other papers in this number, although not entomological, should be read by everyone interested in animal behaviour.

D. F. O.

BUTTERFLY FARMER. By L. Hugh Newman. Published by Phoenix House Ltd., London. Price 16s.

This book of gossip and reminiscence will interest many readers, old and young. The parts about the author's father, L. W. Newman, who started the farm will appeal most. If a few of the stories are apocryphal many are true, and the inaccuracy of some of the statements does not matter much in a book of this kind. The illustrations are good. A little more care would have prevented some mistakes. For instance (p. 82) the name 'pug' was given to members of the genus *Eupithecia* because one of the meanings of 'pug' is 'dwarf', *vide* the Shorter Oxford English Dictionary, not because the pug dog had reached the pinnacle of popularity when the name was given. Cockerell did not catch the yellow female *Pieris napi* mentioned on p. 137. It was caught by F. D. Wheeler and C. G. Barrett's eldest son and was named by Cockerell in 1889. Apparently the author has never heard of Prof. T. D. A. Cockerell since he refers to him as "a Mr. Cockerell".

On pp. 150-151 the author, writing about the Camberwell Beauty, says "I believe I am alone in thinking that these butterflies should not be classed as migrants, but that most of them arrive here simply as

unwilling passengers on board ship". He thinks they are carried in ships bringing pit props from S. Finland, because he saw scores of them flying round stacks of timber and some already settled on the trunks preparing for hibernation in the early autumn of 1935. He was told they were a great nuisance fluttering in the hold. He gives no date, but presumably means September or October. He supports his theory by referring to the map of the distribution of captures in one solitary year—1872, given by C. B. Williams, many of which were near ports on the East Coast.

According to his theory 1935 ought to have been a good year for the Camberwell Beauty, but actually apart from one or two in the South only five were seen 27 miles inland in the Tyne valley, 27th August to 17th September. Butterflies settling down to hibernate before they were carried from Finland would go into hibernation as soon as the cargo reached its destination. But in 1872 most of the *antiopa* were caught or seen on 20th August and the following 14 days, though one was taken on 26th July and stragglers were recorded in October, and some travelled a great distance from the East Coast. In 1896 one was caught, on 10th September, by P. M. Ellis in the Isle of Skye. This is some distance from any port at which foreign pit props are landed. So long ago as 1803 Haworth wrote: "There is something very extraordinary in the periodical appearance of this species They are plentiful all over the kingdom in some years, after which *antiopa* in particular will not be seen by anyone for eight, ten or more years, and then appears as plentifully as before". These facts are much more in accordance with a migration than an importation in ships. Pit props are not and never have been imported sporadically in point of time, with several years' intervals between the arrival of ships. In 1789 Camberwell Beauties are said to have been as common as garden whites. Did they import pit props from Finland in 1789?

C. B. Williams *et al.* in *Trans. R. ent. Soc. Lond.*, **92**, Pt. I, 109-113, summarise the appearances of *V. antiopa* in Great Britain, 1824-1939, and show that 63.5% of the specimens taken in this island were caught in August and September. Mr. Newman's theory implies that in Finland *antiopa* flies down to the docks in August in order to make sure of finding a convenient hibernaculum on pit props stacked on the quays, for use in October. This is rather a hard pill to swallow. I prefer to follow Stainton and C. B. Williams rather than L. Hugh Newman. It is a pity Mr. Newman should mislead young entomologists by putting forward a theory based on a single observation.

E. A. C.

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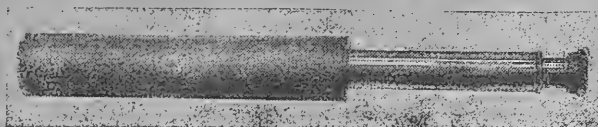
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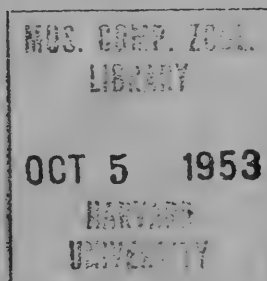
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Aberrations of British Geometridae

By E. A. COCKAYNE, D.M., F.R.C.P.

Plate XIII.

The following aberrations are in the Rothschild-Cockayne-Kettlewell Collection in the British Museum.

Semiothisa liturata Clerck ab. **semivirgata** ab. nov.

The median line is displaced towards the base and fused on the costa with the antemedian line.

Type ♂ : Oxshott, 12.vi.1938, E. A. Cockayne.

Allotype ♀ : Oxshott. R. Adkin coll.

Paratypes 2 ♂♂ : 1 ♂ Oxshott, 1890. R. Adkin coll. 1 ♂ Tongue, Sutherland, vii.1906, E. A. Cockayne.

Biston betularia Linnaeus ab. **nigricosta** ab. nov.

On the fore wing the costa from the base to the subapical mark has a broad black band along it, which includes the discoidal spot. The rest of the wing is white speckled with black. The thorax is black and the collar white speckled with black.

Type ♂ : Loc. incog. (Mason coll. Hanbury coll.) Cockayne coll. The specimen is figured, Barrett, Pl. 301, fig. 1b.

Phigalia pedaria Fabricius ab. **submarginalis** ab. nov. (Fig. 16.)

On the fore wing the second line is absent, but the subterminal dark line is broader and more distinct than usual; on the hind wing the transverse line is reduced to a few dark scales, but the subterminal line is thick and unusually distinct.

Type ♂ : Yorkshire, bred ii.1909. (Bright coll.) Rothschild coll.

Ithysia zonaria Schiffermüller ab. **obsolescens** ab. nov. (Fig. 9.)

All the dark markings on the thorax and wings are replaced by very pale brownish grey.

Type ♂ : Lancs. B.M. 1937-45.

Paratypes 2 ♂♂ : 1 Lancs. B.M. 1937-45, 1. (Gregson coll.) Rothschild coll.

Ectropis bistortata Goeze ab. **bicolor** ab. nov. (Fig. 6.)

The area from the base to the postmedian line on both the fore and hind wing and along the costa of the fore wing to the subterminal line is blackish brown; external to this the wings are of the normal pale colour with the usual markings.

Type ♀ : New Forest, bred. (B. W. Adkin coll.) Cockayne coll.

Ectropis bistortata Goeze ab. **brunneipennis** ab. nov. (Fig. 7.)

The thorax, abdomen, and wings are of a uniform café au lait colour with the markings present; the submarginal line which is white in the darker melanic forms is of the same colour as the rest of the wing in this aberration.

Type ♂ : Wye, Kent, 20.iv.1924, E. A. Cockayne.

Paratypes 2 ♂♂ : 1 ♂ Brockham, 9.vii.1901, W. Anning. Cockayne coll. 1 ♂ Oxshott, Surrey, 4.iv.1906. Cockayne coll.

Psodos coracina Esper ab. **degenerata** ab. nov. (Fig. 10.)

On the fore wing the median band is so much narrowed that it is reduced to three black marks, one on the costa, a second V-shaped one where nervure 2 takes origin from the median nervure, and a third on the inner margin.

Type ♂: Loc. incog. (J. A. Clark coll. 1909.) Bankes coll.

Selidosema brunnearia Vill. ssp. *scandinaviaria* Staudinger ab. **semivirgata** ab. nov. (Fig. 15.)

On the fore wing the second or median line is displaced towards the base and united with the first line to form a broad band; the discoidal spot is external to it instead of lying in the median line as usual.

Type ♂: New Forest, vi.1916, L. W. Newman. (Levick coll. B.M. 1941-83.)

Paratype ♂: New Forest, 1900, N. D. Riley. B.M. 1928-430.

Aspitates ochrearia Rossi ab. **lativittata** ab. nov. (Fig. 2.)

On the fore wing the whole of the basal area to the antemedian line is dark in colour, and the postmedian line on both fore and hind wing is much increased in width to form a band 3 mm. wide.

Type ♀: Suffolk. R. Adkin coll.

EXPLANATION OF PLATE XIII.

- Fig. 1. *Lithostege griseata* ab. *scripta*. ♀. Type.
 Fig. 2. *Aspitates ochrearia* ab. *lativittata*. ♀. Type.
 Fig. 3. *Triphosa dubitata* ab. *pura*. ♂. Type.
 Fig. 4. *Perconia strigillaria* ab. *semifasciata*. ♀. Type.
 Fig. 5. *Perconia strigillaria* ab. *atra*. ♂. Type.
 Fig. 6. *Ectropis bistortata* ab. *bicolor*. ♀. Type.
 Fig. 7. *Ectropis bistortata* ab. *brunneipennis*. ♂. Type.
 Fig. 8. *Lygris testata* ab. *paradoxa*. ♀. Type.
 Fig. 9. *Ithysia zonaria* ab. *obsolescens*. ♂. Type.
 Fig. 10. *Psodos coracina* ab. *degenerata*. ♂. Type.
 Fig. 11. *Eupithecia pulchellata* ab. *guttata*. ♀. Type.
 Fig. 12. *Aspitates ochrearia* ab. *fuscata*. ♂. Type.
 Fig. 13. *Aspitates gilvaria* ab. *vittata*. ♂. Type.
 Fig. 14. *Aspitates gilvaria* ab. *suffusa*. ♂. Type.
 Fig. 15. *Selidosema brunnearia* ssp. *scandinaviaria* ab. *semivirgata*. ♂. Type.
 Fig. 16. *Phigalia pedaria* ab. *submarginalis*. ♂. Type.
 Fig. 17. *Biston betularia* ab. *albapicata*. ♀. Type.

Aspitates ochrearia Rossi ab. **fuscata** ab. nov. (Fig. 12.)

The ground colour of both fore and hind wing with the exception of the inner margin of the hind wing is dark and of the same colour as that of the lines in a normal specimen. The thorax and abdomen are of normal coloration.

Type ♂: Loc. incog. (F. Bond coll.) R. Adkin coll.

Aspitates gilvaria Fabricius ab. **vittata** ab. nov. (Fig. 13.)

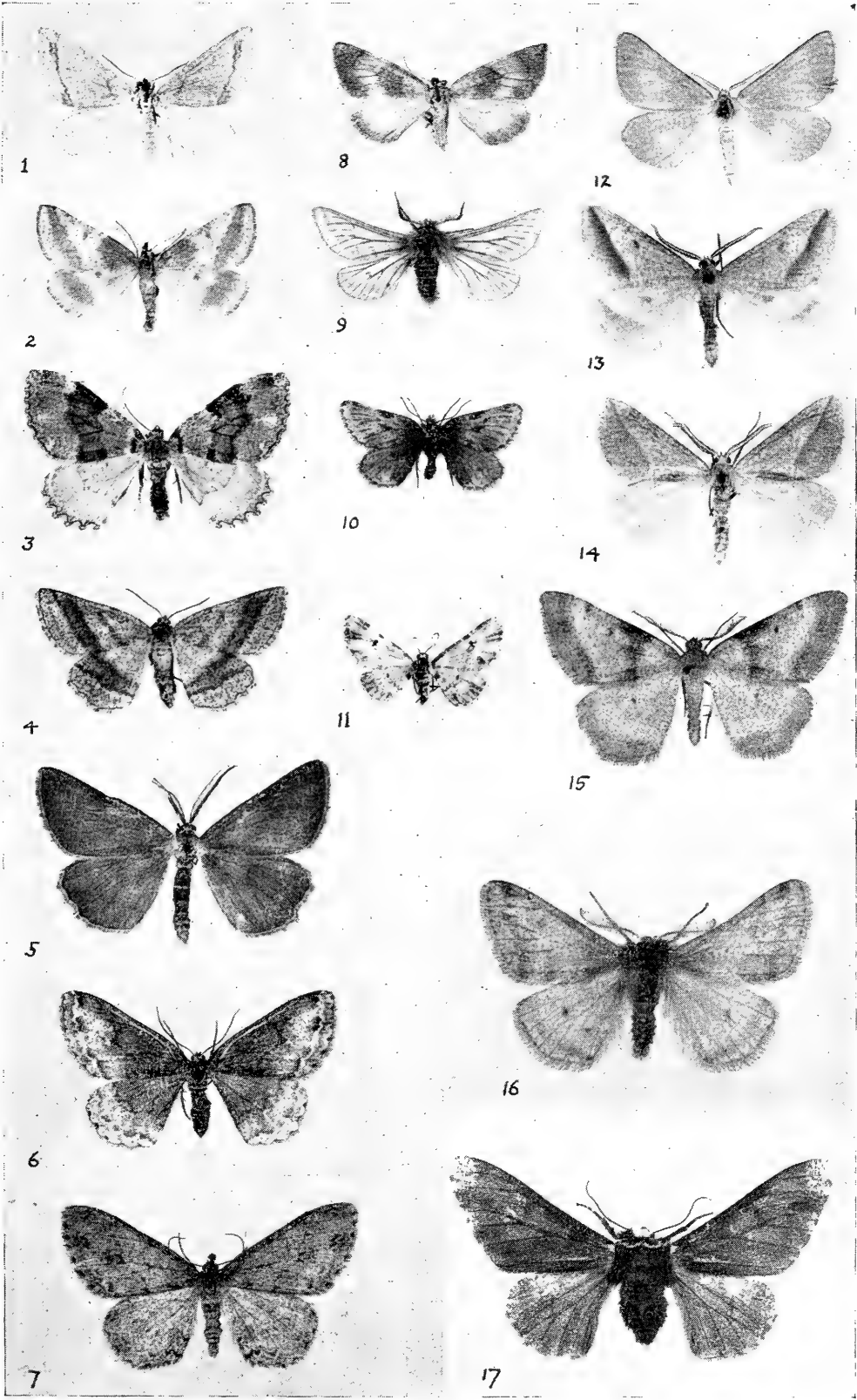
On the fore wing the oblique postmedian line is increased in width to form a broad band, which is ill defined on its distal aspect. The band on the hind wing is a little wider than usual.

Type ♂: Loc. incog. (Clark coll., Bright coll.) Rothschild coll.

Allotype ♀: Dover, 1884, Chatwin. R. Adkin coll.

Aspitates gilvaria Linnaeus ab. **suffusa**. (Fig. 14.)

The ground colour of the fore wing is normal, but so heavily powdered with dark scales of the same colour as the oblique stripe that



little of it is visible; the area just internal to the oblique stripe is the least powdered. The hind wing is normal. The thorax and abdomen are normal. The under side of the fore wing is like the upper side, but the powdering is darker.

Type ♂: Loc. incog. (Salwey's coll., 8.2.1872; Cooke, 1894; C. A. Briggs: Vauncey Harpur Crewe coll.) Rothschild coll.

Paratypes 2 ♂: 1 ♂ S.E. Kent, 1897, C. F. Johnson coll. Cockayne coll.: 1 ♂ Snodland, 9.viii.1901 Burrows. Burrows coll. presented by H. J. Turner.

Perconia strigillaria Hübner ab. **semifasciata** ab. nov. (Fig. 4.)

On both fore and hind wing the second and third lines are approximated and the space between them suffused with dark scales.

Type ♀: Sandburn, Yorks, 1882, S. Walker. (S. Walker coll.) Cockayne coll.

This aberration has a very different appearance from ab. *herpetiaria*, in which the first and second lines are close together with dark scales between them or actually fused.

Perconia strigillaria Hübner ab. **atra** ab. nov. (Fig. 5.)

The whole of both fore and hind wing is a uniform dark slaty grey, almost black, and entirely without markings. The abdomen is the same colour, but the thorax is whitish grey.

Type ♂: Brockenhurst, 1932, Haynes. Cockayne coll.

Allotype ♀: New Forest, v.1934, Gulliver. Rothschild coll.

Paratype ♀: New Forest, vi.1936, H. D. Smart. Cockayne coll.

Oporinia dilutata Linnaeus ab. **albescens** ab. nov.

The ground colour of the fore wing is very pale ochreous, the markings being darker ochreous. The hind wing is whitish ochreous. This is an albino form.

Type ♂: Loc. incog. (Stevens sale 14937, 1933). Cockayne coll.

Lygris testata Linnaeus ab. **paradoxa** ab. nov. (Fig. 8.)

The ground colour is pale ochreous; on the fore wing the extreme base and the median area are pale ochreous, but the areas between the basal and antemedian lines and from the postmedian line to the termen are red-brown; the discoidal spot is indistinct and many of the nervures have dark scales along them. The hind wing is pale and unmarked with the exception of a broad border of the same brown as the dark parts of the fore wing. The thorax and abdomen are pale.

Type ♀: Burnley, Lancs., 1912, W. G. Clutten. (Treadgold coll., per R. L. E. Ford, 1952.) Cockayne coll.

There is a corresponding form of *Lygris populata* L. ab. *inversa* Nordstrom (*Ent. Tidskr.*, 1916, 37, 185). Nordstrom figures a male, and there is a female labelled Rannoch, 1891, in the Rothschild-Cockayne-Kettlewell coll.

Lithostege griseata Schiffermüller ab. **scripta** ab. nov. (Fig. 1.)

The ground colour is the usual pale grey; on the fore wing there is an angulated line near the base and a wavy blackish-grey transverse line near the termen; parallel with and just external to this is a broken line of similar character present at the costa, opposite the cell, and near the inner margin. The hind wing has no markings. On some

specimens of *griseata* one can just see a faint indication of the transverse lines so conspicuous in this aberration.

Type ♀: Breck Sand, No. 13382, 16.vi.1935, C. G. de Worms.

Triphosa dubitata Linnaeus ab. **pura** ab. nov. (Fig. 3.)

On the fore wing at the base there is a single thick black transverse line instead of the usual paler and thinner ones; between the basal area and the median area the usual band of transverse lines is absent, leaving an expanse of shining brown ground visible; the median area is bounded on each side by a single thick black line instead of the usual thin double line, and the two black lines are united by black along the costa; the usual thin transverse lines in the median area are absent, but the black discoidal spot is present in the normal situation and the nervures are blackened; there is a dark subapical spot and a very narrow pale line near the termen; between nervures 3 and 4 there is an ill-defined pale spot on the inner side of the subterminal line and another sharply defined one just posterior to nervure 2. On the hind wing in place of the numerous faint wavy transverse lines there is a single dark line, much more distinct than any normal one, and there is also a narrow wavy pale subterminal line. The median area stands out much more distinctly than in a normal specimen.

Type ♂: Shipley, bred 6.viii.1934, by H. W. Head. (D. Smart coll., Treadgold coll. per R. L. E. Ford, 1952). Cockayne coll.

Eupithecia pulchellata Stephens ab. *guttata* Cockayne.

This was described and named in the June number, p. 167, without a figure. This is now supplied on Plate XIII, Fig. 11.

Biston betularia Linnaeus ab. *suffusa* Cockayne.

This aberration was described in the June number, p. 168, and figured on Plate XII, Fig. 23, but the data were not given. They have now been supplied by Lt.-Col. W. Bowater, who has presented the insect to the Rothschild-Cockayne-Kettlewell Collection. The data are: Folkestone, S. G. Hills, purchased from L. W. Newman, 2.xii.1926.

Biston betularia Linnaeus ab. *albapicata* Cockayne.

This was described and named in the June number, p. 168. A figure is now given on Plate XIII, Fig. 17. The data are: Tibshelf, Derbyshire, 1925, bred from a pupa dug up in December 1924 by A. W. Richards. This information was supplied by Mr. Richards himself.

Hormones and the Development of Hybrid Lepidoptera

It is now well established that growth and metamorphosis in insects are controlled by hormones. Like other physiological activities of the body, the production of growth-promoting hormones is dependent on the hereditary genes. In certain mutants, for example in *Drosophila*, death occurs at an early stage of growth because production of these hormones fails. Disturbances in the proper action of the genes is liable to occur in hybrid insects, and where the growth hormones are

affected abnormalities of growth may appear. The appearance of pupal characters in the larva is not infrequent in hybrid Lepidoptera (Cockayne 1941). Many hybrids fail to develop at all.

It has long been known that in hybrid Lepidoptera the female is more liable to be affected than the male. If the Sphingids *Celerio galii* ♂ and *C. euphorbiae* ♀ are crossed the female pupae fail to produce imagines though they may survive for several years, while the males complete their normal development. It was shown by Bytinski-Salz (1933) that if the wing germs or the ovaries of the hybrid females were transplanted into the hybrid males they would develop normally. He therefore concluded that it is the growth hormones that are lacking in the female pupae.

The converse experiment has now been reported in a very interesting paper by Meyer (1953). In an attempt to induce development in the female hybrid pupae he withdrew a large part of their blood and replaced it by the injection of a similar quantity of blood removed from male hybrid pupae in which adult development had already begun. The experiments were completely successful and Meyer has been able to fill his cabinets with fine series of female hybrid hawkmoths hitherto unknown: *Celerio galii* ♂ × *C. livornica* ♀ = *galivornica*; *C. hippophaës* ♂ × *C. galii* ♀; *C. lineata* ♂ × *C. euphorbiae* ♀ = *güntheri*; *Pergesa porcellus* ♂ × *P. elpenor* = *standfussi* and many more.

He describes in detail the procedure for sterilization and operation. One secret of success is to use a large amount of blood. It is necessary to use blood from rather closely related insects: injection of blood from *Vanessa* into *Celerio* proved fatal. He has succeeded in obtaining normal female *Colias* hybr. *chryseis* (*C. hyale* ♂ × *edusa* ♀); and preliminary experiments, which will be reported in full later, have shown that it may be possible to use the same methods on the caterpillars of hybrids which fail to develop beyond the larval stage.

V. B. WIGGLESWORTH.

REFERENCES.

- Bytinski-Salz, H. *Arch. Entw. Mech.*, **129** (1933), 356-78.
 Cockayne, E. A. *Proc. Roy. Ent. Soc. Lond.*, A, **16** (1941), 55-9.
 Meyer, J. H. *Z. Wiener ent. Ges.*, **38** (1953), 44-62.

Further Remarks on *Plusia festucae* L.

By B. J. LEMPKE.

It is remarkable indeed that, as far as I know, it is not possible to answer the 'Old Moth-Hunter's' question: "Where, and in what stage, does this species hibernate?" (*Ent. Rec.*, **65**: 201). I have never read an article in which the complete life history of the species was treated; nor have I tried myself to fill this gap. Even the article on the species by De Roo Van Westmaas in the famous Sepp (second series, vol. 1, pp. 51-54, pl. 14, 1858) is very incomplete. Not a word is said about the egg and young caterpillar! De Roo writes that the larva overwinters when half grown and pupates "in May and later," but he also tells us that he had never bred the larva himself, so that it is possible that he only copied what he found in literature. A fact of real value stated by him is that Snellen found cocoons in September 1857

on the leaves of *Glyceria fluitans* R.Br. from which the moths hatched on 1st October. This presents us with another difficulty. There are two generations in Holland. The first, which is weak, flies from the second half of May till the end of June. The second generation, which is much commoner, is observed from the second half of July till within the second half of September, reaching its maximum in August and the beginning of September. It looks as if Snellen's specimens belonged to an extra third brood, but it has never been observed again in Holland!

An important note on the larva of *festucae* was published by J. E. R. Allen (*Entomologist*, 27: 270, 1894). He writes: "At Bolton, where I have taken it for many years, half-grown larvae are found in April, and full-grown larvae up to the middle of June; the foodplant is almost always the yellow iris. The pupa is generally in a bend of the iris leaf, about two inches from the point, and the moths begin to emerge at the end of June." That is more than a month later than the earliest date in Holland (24th May)! But it is at any rate certain that the young larva hibernates.

This is confirmed by Karl Uffeln in his *Groszschmetterlinge Westfalens* (1908, *Jahresber. Westfäl. Prov. Ver. für Kunst u. Wissensch.*, Beiheft, pp. 1-158), a publication full of interesting original biological observations. He writes (p. 102): "The caterpillar has been found near Münster in the Lodden Heath in the first half of May on *Glyceria*, reed and *Carex riparia*; they eat the tops of the leaves and sit fully stretched out on the midrib."

Another interesting note on *festucae* is to be found in Warnecke's *Groszschmetterlinge der Umgegend von Hamburg-Altona* (1931, *Verhandl. Ver. f. naturw. Heimatforschung zu Hbg.*, vol. 23 p. 52). Here we read: "Albers got eggs from a ♀ taken on 28.viii.28, from which the caterpillars hatched on 13.ix.28; they pupated from 17.iii.29 and the moths began to emerge on 29.iv.29." This brood was of course more or less forced and Warnecke adds: "The moth is at any rate principally found in August, and it is possible that a second generation is, as with other *Plusias*, only found in favourable years or as a partial generation."

Urbahn and his wife, in their excellent publication on *Die Schmetterlinge Pommerns* (1939, *Stett. ent. Z.*, vol 100, pp. 185-826) give as the time of flight for this part of pre-war Germany 5th June till 24th September, "more numerous only from the beginning of July; evidently in two overlapping generations; but exact breeding observations are still lacking" (p.638).

From all this it is evident that there is still much to be cleared up in the life history of this moth. Not only is the place where the young larvae hibernate unknown but the exact stadium in which hibernation takes place. There is also much doubt about the exact number of generations of this locally common *Plusia*.

Oude Yselstraat 12iii, Amsterdam—Z 2.

Ent. Rec., 1953, 65: 218. EARLY APPEARANCE OF ODONTOSIA CARMELITA ESP. Line 10 of this paragraph, between "ground" and "where" insert "and that the other was found about five feet up the trunk".

Observations on the Larva of *Nola albula* Schiff.

By H. SYMES, M.A.

The Kent Black Arches, like the Kentish Glory, seems no longer to be particularly associated with the county from which it takes its English name. It still occurs there, for one was taken at Sandhurst by Dr. G. V. Bull in 1952 (*Ent. Rec.*, **64**: 350), but I do not know whether it still survives in Chattenden Roughs, where the first English specimens were taken nearly a hundred years ago.

In recent years it has been recorded from several localities in the Wessex area: at Ashley, near Milton, Hants, in 1939, by the late Mr. Leslie Burt (I have a specimen he gave me); Sandbanks, near Poole, Dorset, one in 1951, by the Rev. F. M. B. Carr (*Ent. Rec.*, **64**: 113); and near Swanage, Dorset, commonly in 1951, by Mr. J. Antony Thompson (*Ent. Rec.*, **64**: 182). But all these records were of moths that came to light. To the best of my knowledge there are not many entomologists who have found the larva, so I hope my experiences in finding and rearing a few of them this year may not be without interest.

The occurrence of *Nola albula* in a certain Hampshire wood was accidentally discovered by the late Mr. W. H. Jackson in the 1930's. He found an unfamiliar larva resting on a grass stem, could not identify it, and did not know what food to offer it. Fortunately this problem was settled by the larva itself, which very soon formed a cocoon, from which in due course an *albula* emerged. During the next few years Mr. W. H. Jackson and Capt. R. A. Jackson, who was present at the discovery of this larva, regularly took the insect on the wing in mid-July, but all their efforts to find another larva were unsuccessful. I had a strong conviction that when a species is known to occur in a restricted area diligent search among the food-plant ought eventually to turn up the larva.

Last year Dr. H. King and I visited the locality on 19th June and examined the dewberry bushes, but without success. We may have been a week or so too late, but in any case we had not discovered the secret of where to search. On 3rd June this year the Rev. F. M. B. Carr, Dr. King and I paid a visit to the *albula* ground, and after examining a number of the taller dewberry bushes in vain I was delighted to find a larva low down on a small growth of dewberry. In about an hour I found four more, all in the same sort of place. Dr. King then found one, and after I had gone off to have lunch (it was 2.15 by then) he found eight more. The secret was now out: the larvae are to be found very low down on scruffy-looking bits of dewberry partly hidden among the coarse grass. Looking for them is a back-aching job, and the aid of a small boy with sharp eyes and low in the chassis would be invaluable. It is no use searching the taller bushes. The larva sits on the under side of the leaf (Dr. King, however, found one on the upper side, but in the shade of a bush) and when the leaf chosen is a very small one, as was often the case, the long hairs and part of the body of the larva could be seen projecting beyond the side of the leaf. They showed a distinct preference for the more mature leaves, avoiding the younger succulent ones. I was led to the discovery of more than one larva by noticing that a dewberry stem had been stripped of a few small leaves, only the midribs remaining. One larva, considerably smaller than the

others, had spun a pad on the underside of a leaf and taken up its position there for changing its skin, which it did a day or two later. I paid a second visit to the locality on 10th June and found four more larvae in exactly the same sort of place: these were nearly full-fed.

It would be interesting to know whether the larva has been found in a wild state on any foodplant other than dewberry (*Rubus caesius* L.). The experts seem to differ. South, Barrett and Scorer give a number of foodplants; Tutt (*Practical Hints*, III, p. 81, where the process of finding the larvae is made to appear altogether too easy) and Newman & Leeds give dewberry only, and this was the diet of Buckler's larvae.

There is a very full description of the larva and the construction of its cocoon in Buckler (*Larvae*, III, pp. 41-43). The ground colour of all my larvae was ivory white, and most of them were only lightly marked with grey, but two were rather heavily marked with dark grey.

On the morning of 11th June one larva left its food and took up a position on the side of the cage. Here it remained for twenty-four hours; then it moved to the top, where it stayed until nightfall. I had provided some dry brown stems of rush (*Juncus effusus*) as a pupating site: the larva crawled up one of these, and when I examined the cage at 5.0 a.m. on 13th June it had begun the work of constructing a cocoon from the fibrous surface of the rush: by 7.0 a.m. considerable progress had been made with one of the wing-like sides: by 9.0 a.m. it had fashioned what looked like a tiny open boat and was lying along the centre of it, head upwards: by 11.0 a.m. it had drawn the two sides together except for a small space at the top end, where its head was still visible, and by 11.30 a.m. this gap had been sealed and the larva was totally enclosed. On the same date another larva constructed its cocoon on a dewberry stem, and two more commenced operations on rush stems. When completed, the cocoon resembles that of a Zygaenid in shape, but not in colour, and is of course much smaller. It takes its colour from the material of which it is formed: one constructed on a dewberry stem is darker than those on the dry rush stems. One of Dr. King's larvae formed its cocoon on the underside of a dewberry leaf.

One night two larvae chose the same rush stem on which to make their cocoons, and when I looked into the cage at 7.30 a.m. one of the larvae, which must have been a quick worker, had completed its task. The other had finished making the wing-like sides of its cocoon, but had not begun to unite them. This cocoon overlapped the other, and fearing that the first moth might find its exit impeded I decided, after some thought, to take a chance and remove the larva from the second cocoon. I was afraid, however, that it might not have the energy to start making a cocoon all over again, or a sufficient supply of viscous secretion for mixing with the fibrous matter, chewed from the rush stem. For a few hours it wandered about the cage, looking, I thought, rather disconsolate, but towards evening it climbed on to a rush: at 1.30 a.m. it had made a start with the sides of the cocoon; at 6.30 it had finished them, and at 9.0 a.m. it had drawn them together and made a cocoon indistinguishable from the others. By 19th June seven of my nine larvae had formed their cocoons. There was a considerable difference in the time which they took to make them. About twelve hours, I should say, was a fair average: some took less than this and two spent eighteen hours over the work. They carried on their operations by day and night without discrimination.

The smallest of the larvae I found on 3rd June was full-fed on 23rd June, and during this period it changed its skin twice. I felt quite sorry when it sealed itself up in its cocoon just before 11.0 p.m. on the 24th, for, as Buckler says, the larvae are 'fearless little fellows' and when you pick up the dewberry leaf on which a larva is feeding to examine it more closely—for it remains on the underside even in captivity—the larva does not fall off the leaf or indeed take any notice at all.

Moths emerged from all nine cocoons, two on 6th July, two on the 7th, two on the 9th, and the remainder on the 13th, 15th and 17th July. The last moth to emerge did not come from the last cocoon to be formed. There were four males and five females. With one exception the moths emerged in the forenoon, at some time between 8.0 and 11.0 a.m. The exception I found with its wings not yet expanded at 8.45 p.m. on 9th July. A bred specimen of *N. albula* is a very beautiful insect, but the powdery scales are very easily dislodged.

Dr. King was less fortunate with his larvae. He bred four *albula* and five ichneumon flies, similar in appearance to those which he had bred from larvae of *Eupithecia inturbata*.

An Entomologist in Argentina

I. Early days. The Chaco Santaferino

By KENNETH J. HAYWARD, D.Sc.(Hon.), F.R.E.S.

I arrived in Argentina just thirty years ago and after a week in Buenos Aires, during which I spent a good deal of time in the parks looking over the butterflies, proceeded to the small factory town of Villa Ana in the north of the province of Santa Fé. Here I was to pass six summers.

At first my hours as an engineer in the tannin factory were long, and eager as I was to explore the new world now laid at my feet, my collecting had to be confined to Sunday afternoons. Later when I was transferred to the office of the Superintendent of Factories I found myself free from mid-day on Saturday till Monday and on all national and religious holidays.

With the ignorance and enthusiasm of youth I immediately began to compile a list of the country's butterflies, but in a very short while I found that I had set myself a task beyond my power, since it was in most cases not possible to classify my captures with the inadequate literature at my disposal. My enthusiasm would no doubt have received a still greater setback could I have then foreseen that this task was to take me twenty-seven years and that even now additions are being made yearly to our total of over twelve hundred species, subspecies and forms.

Though I abandoned my early attempts at preparing such a list, I lost no opportunity of collecting and studying every kind of insect, sending all my material to South Kensington. I would like to acknowledge the invaluable assistance received through those Chaco years from the staff of the Natural History Museum in identifying my cap-

tures and I often shudder to think of the hours they must have lost over this task and in preparing those long lists of names to which I still make frequent reference. More valuable even than the naming of my insects was the moral support and encouragement I obtained from their frequent letters.

During the first year my collecting was restricted to the immediate neighbourhood of Villa Ana, but with my transfer to office work and the necessity of frequent visits to our other factories, I was later able to explore many places scattered over an area about half the size of England, though the nature of the country varied little and the fauna, except for a few local species, was everywhere very similar.

Although the butterflies I caught at first were of the commonest, they were strange to one who knew only those of Europe and northern Africa, and the thrill I obtained from netting them has never been repeated; only the clouded yellows and the painted ladies had a familiar look about them.

The country in which I now found myself was flat and covered with hardwood forest, the woodland being broken up by large tracts of coarse sawgrass that in places grew shoulder high and by the *esteros*, low lying areas of the same grass which became inundated in the wet season, home of duck and teal and other water birds.

The village lay in the centre of a large opening nearly two miles in diameter, the western half covered with sawgrass, the eastern portion coarse weed-covered grassland with a few fields of maize and millet and about an acre of alfalfa. It was in this latter area that I made my first essays at collecting and I often dallied for a short time in the alfalfa, looking over the clouded yellows.

Like *crocea*, *Colias lesbia* has both a yellow and a white female form, the latter often predominating. Small though was our patch of alfalfa, the colour variation of the females it produced was really extraordinary, ranging from deep yellow to primrose, from chalk white to cream, whilst freshly-emerged specimens of both sexes were frequently shot with a deep coppery lustre. It was soon after my arrival that I had the fortune to net in succession a primrose male and that strange gynandromorph described in *Ent. Rec.*, 39: 97-100, in which the upper-side forewings and left hindwing were of the white female form but streaked with yellow and the right hindwing male streaked with white, whilst beneath one side was of the normal male colouring and the other side that of a white female. I think most entomologists will agree that a collector should be content with one such freak, but exactly six years later to the very day whilst collecting on the outskirts of some virgin forest near Punta Lara to the south of Buenos Aires I caught another, similar in all respects except that in this case it was the left forewing that was male. I suspect that this streaking of yellow with white and *vice versa* is not so uncommon in *Colias lesbia* as we might suppose, as there is in our collections a perfectly halved male and white female gynandromorph in which the white hindwing is rayed with yellow and I have seen yet another white female with yellow patches on the forewing.

For a considerable distance round all the factory towns the forest was very open as it had been cleared years previously of the red quebracho which was the source of our tannin and of the majority of the

other hardwoods. There was, however, a fairly thick and in places impenetrable undergrowth that made it necessary to keep to the waggon tracks that still remained from those days when the forest was being exploited and which ran in all directions. After heavy rain these tracks became quagmires, and where they dipped a little pools formed, as they did in every hollow in the woodland, so that one often had to wade and mosquitoes rose everywhere in clouds.

Collecting within the forest itself never produced much, either butterflies or other insects, and though I could seldom resist exploring it was generally a waste of time. I think about the only butterflies I ever caught there which I could not have obtained more easily in the open were a *Hamadryas* (perhaps better recognised under the name *Ageronia*) and two species of *Anartia jatrophae*, which was rather scarce and the lovely *Amalthea roeselia*, both of which were occasionally to be found near certain waterlogged hollows. I did, however, in my fifth year take a *Castnia phalaris sora* in the forest, the only *Castnia* I ever saw in those parts.

Undoubtedly the best place for collecting was along the edge of the woodland and in the many openings that ran back into the forest where the ground was fairly free of undergrowth and covered with scattered bushes and flowering plants. It was here that one saw *Papilio thoas brasiliensis*, whose females sometimes spanned as much as five inches, and whose caterpillars could be found on a wild *Rutaceae* and in our gardens on the orange trees, and also in one restricted corner the beautiful and somewhat scarce *Papilio hellanichus*. The earlier stages of this latter swallowtail were still unknown and as it confined its activities to one small glade of about a couple of acres in extent, rarely straying further afield, I did not contemplate any difficulty in remedying this defect. However, it was four years before I achieved my end, which was finally brought about by seeing a *hellanichus* flying round and round a small *Berberis*. Though it did not alight, I was mindful of another afternoon when on Mount Troödos a male *cleopatra* brimstone had given away the hiding place of its females by a similar manoeuvre, and searching this plant and neighbouring bushes of *Berberis* I found at last both the eggs and young larvae of the swallowtail.

The majority of the butterflies one caught along the forest verge were woodland varieties, shade loving *Euptychia* satyrids that seldom stray far from the undergrowth, *Thecla* blues of which there were some fourteen or fifteen species including the magnificent *marsyas* and *polybe*, and of course a large number of *Hesperiidae*, which family supplied a third of our local list of about 115 species and which seemed to be the only butterflies attracted by the pink blossoms of *Vernonia chamaedryas*, a bushy composite that, like the golden-rod, grew in large conspicuous clumps. Apart from these, practically all the other local species would put in an appearance at some time or the other and I remember especially the big yellow *Phoebis sennae* and *cipris*, the latter for the odour of butyric acid it sometimes gave off and both for the marked preference they always showed for red flowers.

The part of the forest to which I refer and where I usually collected lay about three-quarters of a mile from the village and could be reached either by a track that gave access to the cultivated fields or by crossing the intervening uncultivated ground. This latter waste was knee

deep in flowering weeds and grasses and harboured great numbers of snakes, including the poisonous *yarará*, many of which made their home beneath the numerous termite nests, and was separated from the woodland by a narrow belt of sawgrass in which one occasionally came across the large yellow *Felis pajeros* (wild cat) or the small *guasuncho* deer.

Though the sawgrass belt produced little else than two *Clytrinae* beetles that could generally be found in numbers on some scattered mesquite bushes, insects abounded on the waste ground owing to the diversity of its flora, and it was always worth while to sweep as one crossed it. Here, too, *Euptoieta claudia hortensia* with its golden-spotted chrysalids bred, and the larvae of *Junonia evarete hilaris* sometimes occurred in thousands. This latter butterfly was on the whole very constant in pattern and colouring, but when the earlier stages had been passed under conditions of excessive atmospheric dampness, a relatively high percentage of the dark form *hübneri* might result.

Whether it is that their sloping banks accumulate more warmth or more readily intercept the passing wind-borne seeds, or whether there is some factor of better drainage or greater shelter, railway embankments always seem to produce a very wide selection of the local flora and in consequence prove more than usually attractive to many kinds of insects. This was the case also in the Chaco, where the Company I worked for owned over six hundred miles of track connecting their factories with those parts of the forest then being exploited. These railways ran almost exclusively through worked-out forest and were in places embanked to avoid any danger of flooding. At these points they possessed an additional attraction (not overlooked by the mosquitos), in that the excavations alongside from which the earth for the bank had been taken were more or less permanently filled with water and had their own aquatic flora.

Apart from Crambids and other small fry that were disturbed as one walked through the grass, there were few day-flying moths and I soon gave up searching tree trunks when I failed consistently to find anything by this method. On the other hand, moths and many insects were attracted in great numbers to light, especially on those sultry evenings that preceded the violent electric storms that visited us periodically during late spring and summer. I tried sugaring but without much success; but I suspect that this was due in great part to a certain lack of enthusiasm! It took courage to forgo a night's sleep after twelve hours in the factory, knowing that one had to be on duty again at six next morning, and apart from that it was lonely wandering in the forest after dark and there was always the possibility of stepping on snakes.

Practically all the moths I caught were those attracted to light. I had no need to use sheet and lantern as my house was at the extreme edge of the village and possessed a well lighted whitewashed verandah that faced the forest and was separated from it only by a level expanse of waste, in itself a rich source of insects, so that on favourable nights the walls and floor became covered with specimens of all kinds. On one such night the number was so fantastic that I made a rough calculation by measurement and sampling, which convinced me that there were more than a quarter of a million insects present. Most of these were of course tiny flies, jassids and fulgorids, but there was a good sprinkling of larger species and of the other Orders. There were, however, nights when not a single insect came to light, a fact always pre-adver-

tised by the failure on the part of my six verandah toads to put in their usual appearance shortly after sunset.

For several months I was on night duty in the factory, which was illuminated everywhere both within and without by powerful electric lights, and as it stood a little apart from the village, these were plainly visible over the surrounding country right up to the forest. Quite a number of the rarer moths I obtained at Villa Ana were the result of this spell of duty, some of them being species that did not arrive till the early hours of the morning.

A study of the lists of those moths that were determined for me seems to point to a rational distribution of the various families and to call for little comment. The inclusion in one such list of ninety-six pyralids out of a total of a little over three hundred species is, I think, due to the predilection shown by Mr. Tams at that time for representatives of this family, rather than to any preponderance of these moths in the local fauna! It seems strange, however, that in a country so well supplied with Sphingids that the names of only five appear and one of those a day-flying *Sesia*.

. What I have written above might lead the reader to suppose that I restricted my collecting activities to the Lepidoptera, but this was far from being the case. It was not long before I began to exhaust the possibilities of the butterflies, and my walks would produce few novelties or species worth catching, so I turned my attention to the other Orders, collecting the bees and wasps and larger flies, sweeping and beating for beetles, plant bugs and grasshoppers, and searching under old logs and the loose bark of trees for whatever might turn up, sometimes receiving a none too pleasant surprise.

With exception of the Lepidoptera, a considerable number of the insects I caught were still undescribed, which was only to be expected since I was collecting in virgin country as far as entomological research was concerned. I have before me for example one of Dr. China's lists of *Hemiptera-Homoptera* in which out of the thirty-four species sent him he notes nineteen as not being previously represented in the Museum collections and at least three as new to science. In all I collected just short of fourteen thousand insects whilst at Villa Ana.

One insect of which I obtained a limited number calls for attention as it must be one of the bulkiest in existence to-day. This was the giant Dynastid beetle *Megasoma janus*, whose males when fully extended may cover a space of six inches over all and have a displacement value of from fifty to fifty-eight cubic centimetres, the females being smaller. The grubs when fully grown are rather repulsive looking creatures and would provide two or three good mouthfuls for any grub-eating indian. When I sent my first specimens to South Kensington, the male was acclaimed as something rather out of the ordinary and as the first perfect specimen of the beetle to have reached England, but I have since found it far less rare than usually supposed, though it is never very common.

It was in Villa Ana that I was first introduced to that strange aspect of insect life known as migration, which I found occurred with reasonable regularity at the commencement of each autumn, that is to say towards the end of March. About this time certain species, especially our local buckeye, *Junonia evarete hilaris*, and the common *Ascia*

monuste white, would be observed day after day flying in a northerly direction with that steady flight that distinguishes the butterfly on migration from the casual passer-by. On one occasion I was witness of a mass flight of butterflies of a kind I have never seen repeated. Late on a March afternoon I noted on the horizon a small smudge such as might have been caused by smoke from a grass fire or an approaching swarm of locusts, and as it came nearer this resolved itself into a compact mass of butterflies containing at least nine different species, thousands of dragonflies bringing up the rear. This swarm was at least half a mile wide and probably of considerably greater extent and took just under half an hour to pass. I also sometimes saw great masses of Odonata. In this country dragonfly migrations or mass flights sometimes precede the dry south-west wind known as the *pampero* that from time to time sweeps across the level central plains of Argentina.

Towards the end of my second year in Villa Ana I found myself devoting more and more of my spare time to the magnificent mixed shooting available literally on my doorstep, and the approach of any holiday generally found me torn between a desire to spend it shooting and a sense of duty to my Entomology. It was due to the kindness of Mr. Riley that I was eventually provided with a solution, for he sent me a small folding net that easily fitted my pocket, so that henceforward I was able to shoot and be at the same time prepared for any entomological contingency. My shooting undoubtedly took me to many places I should never have visited solely in search of insects, especially to the *esteros*, and on every possible occasion to that wonderful pond-studded area that lay between the great river Paraná and the small Pindó and Paranaminí, where in the narrow strips of riverain forest that bordered these rivers I caught the clicking *Hamadryas* and the swallowtail *perrhebus* and in the cane brakes *Riodina lysippoides*.

It was through shooting also that I was led to a solution of the problem of ant survival in flooded areas. One day when wading waist deep in an *estero* after duck I noticed everywhere, either floating or attached to the stems of water plants and rushes, small black or reddish masses, some of which were as large as tennis balls. On closer inspection these proved to be living balls of ants which, having been driven from their nests by the encroaching waters, had adopted this method of survival. Undoubtedly mortality from suffocation and drowning must be high, but out of the millions of ants that form these balls enough will remain alive to permit the colony to be refounded when the ground once again dries. Ants were a plague in the Chaco, small red ants that raided the larders, black leaf-cutting ants that destroyed our gardens, and the large reddish *Atta* with their huge sexual forms whose nests, measuring often four or five yards across and three or four feet high, were prominent everywhere, their bare surface perforated by the many domed adits that gave access to the subterranean galleries and from which the narrow ant-roads, often more than a hundred yards in length, ran in all directions.

With those of Cyprus, my Chaco days provide my happiest memories. Days in the sun collecting insects; camping along the rivers in clearings where the scent of wild petunias was almost more than one could bear; fishing for dorado and the giant *surubí* and, above all, the most wonderful rough shooting that has ever fallen to my lot, unre-

stricted and unlimited, snipe and *tinimous* and pigeon, wild turkey and *charata* and a host of other local game birds, and in their season duck and teal, of which no less than seventeen species fell to my indifferent aim.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Alispa angustella Hüb. The larvae of the second brood of this moth are to be found in berries of the spindle-tree at the end of September. They spin two or three berries together when in the last skin and can easily be found by the quantities of frass extruded. For pupation they burrow into dead wood when at liberty; in captivity they spin easily enough in holes bored with a gimlet in virgin cork, or will make their own puparia in rotten wood from a willow trunk. I have found this latter material generally useful when obtainable. I particularly remember watching a larva of *Apatele alni* cutting chips from it and going right into it at Horning. I bred that moth the following year—this was in pre-m.v. days when *alni* was ALNI.

If cork be used it must be left in the garden for several days before being supplied to the larvae as they do not pupate till the following spring and must be kept out of doors, so if the cork be given to them dry it may swell, with bad results when placed in the rain.

The moth emerges in June. Its distribution is capricious in my experience. I have never found it off the chalk, but on the chalk downs I have found it locally from the west bank of the Medway to Wiltshire. Oddly enough I have never seen it east of the Medway, though it is probably there.

Epischnia boisduvaliella Guen. This very local larva may be found on the sea-pea (*Lathyrus maritimus*) in East Anglia in September. It is said also to feed on *Anthyllis vulneraria* and restharrow (*Ononis*), but I have never seen it off the sea-pea, which is locally common on the Suffolk coast (Aldeburgh, Thorpeness, etc.). *E. boisduvaliella* was a lost species for many years until the late Sir John Fryer found it near Southwold. Subsequently it has been bred in quantity by Mr. L. T. Ford and others.

The larva, as usual, must be kept through the winter out of doors, with good drainage. Like *Dioryctria abietella* Schiff. it makes two cocoons, one in the autumn for hibernation and another without further feeding in the spring for pupation; but if given plenty of sand it is not much bother.

Homoeosoma nebulella Schiff. Seed-heads of thistle and ragwort collected in East Anglia (and no doubt elsewhere) will produce this moth if kept out of doors till May. I seldom see *nebulella* now; about 1930 Fryer asked me to get him larvae of *H. cretacella* Roes. to experiment with as a possible enemy of ragwort in New Zealand. He then told me that all the ragwort-feeding Phycitids he could find in East Anglia had proved to be *nebulella*, which was ineligible as an immigrant as it was known to change its foodplants at times and was therefore potentially dangerous.

Phalonia dipoltella Hüb. Heads of yarrow collected in September and kept out of doors will yield this beautiful insect the following July. I have always found it a coastal moth and attached to light soil, chalk, sand, shingle, etc., but subject to these limitations it may be sought successfully in many places from Margate to the Isle of Wight. The perfect insect, which, unlike most of the group, may be disturbed freely all day, varies very greatly in the number and breadth of the orange bands of the forewings.

Cacoecia pronubana Hüb. This bright little moth flies very freely on sunny mornings in late September and early October about 8 a.m., G.m.t. It is now fairly generally distributed and in warm summers has sometimes three broods in a year, always two; but, if wanted, it is better to take the last brood, as setting is then slowing down.

Notes and Observations

VANESSA CARDUI LINN. IN MERIONETHSHIRE.—On 2nd May I took a specimen of *Vanessa cardui* on the south side of the Cader Idris range, Merionethshire, at 1,270 feet above sea-level. The only records for *V. cardui* in Merionethshire of which I know are given in Vol. 2 of the *Proceedings of the Chester Society of Nat. Sci., Lit. and Art*, one specimen on Arenig (2,800 ft.) in 1917 by R. E. Vaughan-Roberts, and in Vol. 4 of the same, one at Dolgelly in 1950 by R. Prichard and one on the Barmouth-Harlech road about 1950 by J. N. Thornton. My specimen was flying north when taken. On being released it resumed its course over the range.—G. G. E. SCUDDER, 3 Six Acre Cottages, Fawkham, Dartford, Kent. 13.vii.53.

EUBLEMMA PARVA HÜB. IN SURREY.—You may like to record the occurrence of *Eublemma parva* Hüb. at light at Dunsfold, Surrey, on 23rd May. I was sitting beside a sheet, with the lamp suspended above, when the moth settled on the toe of my boot.—W. E. MINNION, 40 Cannonbury Avenue, Pinner. 17.vii.53.

ACHERONTIA ATROPOS LINN. NEAR SALISBURY.—You may be interested to know that I have had a report of *Acherontia atropos* from near Salisbury. It was a worn male and flew into a bedroom on 5th July.—C. M. R. PITMAN, 'Malvern', Southampton Road, Clarendon, Salisbury. 10.vii.53.

FOODPLANTS OF POLYCHRISIA MONETA FAB.—With regard to Mr. Allan's argument with 'An Old Moth-Hunter' on the foodplants of certain moths years ago, *Polychrisia moneta* was generally distributed in the southern counties before Delphiniums became so common and there fed on Monk's-hood (*Aconitum napellus* L.), which was found in almost every garden but is much less grown now.

In 1902 A. B. Farn showed me how to get *moneta* in the shoots of his Delphiniums in the garden at Greenhithe, but told me it preferred Monk's-hood. The following year I found it very commonly at Springhead Tea Gardens, between Gravesend and Southfleet, and here it was

almost entirely on Monk's-hood of which more was grown than Delphinium, the few Delphiniums being almost free of larvae. I always reared *moneta* on Monk's-hood, of which we had a lot in our garden; the few Delphiniums were taboo as my mother liked them.—H. C. HUGGINS, 65 Eastwood Boulevard, Westcliff-on-Sea. 20.vi.53.

MORE SUCCESS WITH THE M.V. LAMP.—I have been having a most exciting time with my M.V. lamp. I work it against the whitewashed wall of my house so that an area of roughly a hundred and forty square feet is brightly lit. On this recently I estimate that there have been over seven thousand moths, with innumerable winged white ants, bugs, beetles, grasshoppers, etc. I have been trying to rough out a short paper for you, but it is difficult to know where to start. Unfortunately all this mass of insects contains very little that is new or interesting, the great bulk being Noctuidae and Pyralidae of three or four species only. You can imagine that it is not too easy to isolate something that is wanted from the swirling mass on the wall.—D. G. SEVASTOPULO, Kampala, Uganda. (in lit. 16.vi.53.)

YELLOW BURNET MOTHS IN HAMPSHIRE.—A specimen of *Zygaena filipendulae* Linn. ab. *flava* Robson (*cerinus* Robson and Gardner) was obtained at Shawford Downs on 26th July by Mr. R. Houghton. The condition suggested that it had been on the wing for some time before capture.

It was in this locality I first encountered ab. *flava*, a feral imago in 1947; further colour forms followed and were reported in *Ent. Rec.*, 64: 117. Last year (1952) all Zygaenid activities were carried out on St. Catherine's Hill, approximately three miles from Shawford, when the combined efforts of two colleagues produced two ab. *aurantia* Tutt and one ab. *flava*, the emergence of the latter being arrested by the cocoon and the moth remaining undeveloped. These were among 936 imagines from cocoons collected on the Hill.

Although both *Z. filipendulae* and *Z. trifolii* Esp., are extremely abundant in these areas aberration other than colour is rare, confluent-spotted specimens being almost non-existent.—PAUL H. HOLLOWAY, Warwick House, Fair Oak, Eastleigh, Hants. 2.viii.53.

AMATHES ALPICOLA ZETT. IN AN "ODD" YEAR.—The Editor has suggested that I put on record the capture of a specimen of *Amathes alpicola* during an "odd" year, namely 1909. The moth, which was a female, was found during the afternoon of July 28th crawling over Crowberry (*Empetrum nigrum*) on a mountain in north Ross-shire. Though I cannot now recollect the exact spot, it was somewhere within the portion of Ross-shire which thrusts northwards, like a pointer, into Sutherlandshire, east and west of Long. 4° 54' W. The area lies north of the main Invershin-Lochinver road. It was then, and may still be, part of the Lubecroy deer forest. Lubecroy Lodge is 356028 on the National Grid. A reference to the map shows that the mountains rise to a maximum of about 2,000 ft. at the most northerly point of the area.

Although the insect was taken so long ago I have no doubt at all about the date of capture; nor as to its identity as I later became very familiar with the species at Rannoch. Unfortunately I no longer have the specimen, neither was it in my recently sold British collection. So

far as I can recollect it was sold at Stevens's in about 1913 with a small miscellaneous collection of insects. This occurred after I had bred a fine series of Rannoch specimens and when, unfortunately, I did not realize the interest attaching to an "odd" year *hyperborea*, as it was then called.—E. S. A. BAYNES, 2 Arkendale Road, Glenageary, Co. Dublin.

LEUCANIA UNIPUNCTA HAW. AT LIGHT.—While collecting near Killarney, Co. Kerry, on the night of 13th/14th June of this year, with Capt. Stuart Wright, we caught, at his mercury vapour lamp, a specimen of *Leucania unipuncta*. So far as I have been able to ascertain most, if not all, the previous specimens taken in Great Britain and Ireland have been found during the autumn and early winter; moreover I have been unable to discover, from the books at my disposal, whether the moth is normally double brooded. I should appreciate information about this.—E. S. A. BAYNES, 2 Arkendale Road, Glenageary, Co. Dublin.

METHOD OF PAIRING ARCTIA VILLICA LINN.—The remainder of the *A. villica* emerged very well (see *Ent. Rec.*, 65: 219), but no more outstanding variation has occurred though there have been many more with the spots confluent, missing or reduced in size; but there have been no more black or partial black ones. I have found a more successful method of obtaining pairings with them: I set the males free and when climatic conditions are favourable they return and assemble freely round the breeding-cages containing the females, a pairing being readily obtained when the males are permitted to enter the cages. I have now some thousands of young *villica* larvae, but not all from selected parents although they are all from the original stock. The males liberated were all marked to make it possible to recognise them when they returned to the females. It would have been interesting if an unmarked male had put in an appearance as I do not know of *villica* occurring anywhere in this area in the wild state.—C. M. R. PITMAN, Malvern, Southampton Road, Clarendon, Salisbury. 30.vi.53.

SEXUAL SELECTION IN LASIOCAMPA QUERCUS L. F. CALLUNAE PALMER.—On 26th June the emergence of a ♀ *Lasiocampa quercus* L. f. *callunae* Palmer was followed by a fine sunny day. Although there was a strong N.E. wind blowing—it had been in that quarter for weeks and there seemed little chance of a change—I decided to try assembling on the moors. I reached Beeley Moors at nine o'clock and as I wanted to obtain fertile eggs rather than male imagines I placed the ♀ on the heather and proceeded to search for larvae.

For a long time no males appeared: it was 11.50 when the first one approached; but he flew by without even stopping. Within a few minutes after this ten males had arrived and had passed by in a similar fashion. I came to the conclusion that the proximity of a wall was confusing the line of scent, for the males all flew along the wall instead of approaching the female. I then moved the female a few hundred yards away and tried again. But I found that the ♂♂ were still overshooting the mark by a foot or more and losing the scent again. Moreover, they all seemed to be 'skittish' and in a hurry to get away. I had left a large piece of white paper to mark the female's position so that I should be able to find her easily, and it occurred to me that pos-

sibly this was disturbing her suitors. So I removed the paper and watched again.

Within a few minutes, at about 12.20, two males found the female and were jostling her. She would have nothing to do with them and after a little they flew away. It was not long before three more males were fluttering round her; but again she refused them all. She moved a few feet away and took up a fresh position. Males were now arriving continuously and trying to pair with her, but it was not until 12.50 that she accepted one. The hustle died down and although a few males arrived during the next twenty minutes they soon travelled on. At least forty males had assembled to my female in an hour and all had been refused except the one. I boxed the paired moths and in less than three hours the female had laid 150 eggs.

I have read that *L. quercus* ♂♂ will assemble to the box or even haversack in which a female has been carried, but on this occasion neither had the slightest attraction for them.—J. H. JOHNSON, 53 Knighton Street, Hephthorne Lane, Chesterfield. 5.vii.53.

[We do not remember to have heard or read previously that *L. quercus* f. *callunae* exhibits sexual selection. Our own experience has been that bred ♀♀ of this species will pair readily with the first male put into the breeding cage.—ED.]

[On referring to my diaries I see that on 19th June 1943, in Wales, a newly-emerged ♀ *callunae* refused to pair with an assembled ♂ when they were placed in a large cage and that when removed from the cage this ♀ paired immediately with another male who flew up. Have any of our readers known a ♂ *callunae* to pair more than once? Perhaps the reason why no males were attracted to Mr. Johnson's box or haversack is that the female when in them was not 'calling', i.e., her scent gland was not extruded.—P. B. M. A.]

A RAPID IMAGINAL DEVELOPMENT.—The following is taken from a letter from a friend who spent last winter in East and South Africa:—

"One rather interesting experience was the finding of some larvae of either the Milkweed butterfly or at any rate a very near relative. The larvae, in all stages of growth, were in great profusion and butterflies were laying still more eggs on a shrub of what I imagine to be one of the Milkweed plants near the harbour at Tanga. The leaves of the shrub were whitish, rough and fleshy, and exuded a milky substance when picked.

"I took some leaves and four half-grown larvae and for want of something better put them in a cardboard chocolate-box. They ate with unbelievable rapidity, never seeming to stop, and by the next evening one had pupated, and the other three by the following morning. Being in such numbers I did not really expect other than that they would all be parasitised, but to my surprise all four butterflies emerged four days later!"—F. H. LYON, Sampford Peverell, Tiverton, Devon. 26.vi.53.

COLOCASIA CORYLI LINN. IN SURREY.—With reference to the note on *C. coryli* in the July/August number (*Ent. Rec.*, 65: 209) it might be of interest to record that the larvae of this species are quite common on the lower branches of the big beech trees which grow along the top and sides of the Downs at Ranmore near the church, close to Dorking.

I have frequently beaten the larvae in this area, where I would class it as common in favourable seasons. It is very easy to rear.—R. E. PARSONS, Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. 1.viii.53.

A NOTE ON *COLOCASIA CORYLI* L.—With reference to the notes on this species in *Ent. Rec.*, 65: 209-211, Barrett is right in saying that it is found "in Berkshire . . . on the hills among beech". I have beaten larvae from large beech trees on top of the downs above Wantage, and also on lower ground near the 'Blowing Stone' at Kingston Lisle. I have certainly found this larva more often on beech than on any other foodplant, and have beaten only one larva from hazel, in Cranborne Chase two years ago. But I can add another to the list in Allan's *Larval Foodplants*, for on 30th September 1925 I found a larva feeding on aspen (*Populus tremula* L.) at Malvern. I can support from my own observation the statement that they retire to a hiding-place between leaves after finishing a meal.—H. SYMES, 52 Lowther Road, Bournemouth. 25.vii.53.

HIBERNATION OF *PLUSIA FESTUCAE* L.—The article by An Old Moth-Hunter on the hibernation of *Plusia festucae* L. (*Ent. Rec.*, 65: 199) greatly interested me and I trust the following personal experience in breeding the moth may assist in lessening the uncertainty surrounding its hibernation.

On 22nd June 1933 I caught a female *festucae* in my garden at Doncaster, which incidentally boasted of a lily pond containing a growth of yellow flag (*Iris pseudacorus*). Placed in a chip box the moth laid freely and ultimately I had about 150 eggs, all of which duly hatched.

Feeding presented no difficulty as the lily pond provided the food-plant. I dug up an iris root, put it in a large jam-pot, and accommodated the leaves in a long sleeve, the top of which was tied for support to the sill of an attic window. This attic faced roughly west and got the benefit of the afternoon and evening sunshine, and as a result got extremely hot at times. Possibly it was this condition which fostered the success in breeding.

All the larvae fed readily and nothing untoward was noticeable until they had attained a length of about half-an-inch. A curious situation then manifested itself. About half the larvae continued to feed voraciously while the remainder absolutely refused to feed further, clinging immobile—mostly to the undersides of the leaves—and completely ignoring the gluttonous proclivities of their brethren. They remained thus in a comatose condition while the others duly spun up and pupated, and in August I had a large emergence of over 50 imagines. Having obtained all the moths I required I confess that I lost interest in the surviving larvae, which to my mind had evinced an unshakable resolve to hibernate as larvae.

A fortnight's holiday now supervened, and on my return I found that the continued hot weather had dried up the iris leaves and that a number of the larvae had died. I took pity on the survivors and dumped them in the middle of the iris growing in the lily pond, and left them to fend for themselves. On the following dates, viz. 15th June 1934, 18th June 1935, and 5th July 1939, I took *festucae* in my garden. My last record was 1939, but I have a strong recollection,

though no specific record, that a few years ago while fishing in late August near Doncaster I saw a worn *festucae*.

I am convinced therefore that as a general rule the larvae hibernate as such when comparatively small, since in a normal year I have seen the imagines only in June or early July; in a hot summer, however, some larvae elect to feed up and provide an August emergence. In this respect they resemble *P. chrysitis*, which I have bred with results identical with those of the *festucae* mentioned above.—L. G. F. WADDINGTON, 8 Lawn Avenue, Doncaster.

A NOTE FROM PURBECK.—*Vanessa io* and *Polygonia c-album* have been very abundant during the last fourteen days in many parts of the island. On 4th July I found larvae of the latter species feeding on gooseberry in my garden. Males of *Lysandra coridon* were flying on 4th July in many localities, and on the 8th *Melanargia galathea*, *Argynnis aglaia* and *A. paphia* were observed in fair numbers. In a wood less than two miles from the sea I turned up a new spot for *Limenitis camilla*.—LEONARD TATCHELL, Swanage, Dorset. 6.viii.53.

A NOTE FROM EAST DORSET.—I have nothing much to report. Insects are well out to time; for instance ♂♂ of *Argynnis aglaia* and *Melanargia galathea* were on the wing ten days ago. Larvae of *Vanessa io* have been swarming everywhere. But there has been no sign this year of either *Colias croceus* or *C. hyale*, and I have seen only one *Vanessa cardui*.—LEONARD TATCHELL, Rockleigh Cottage, Swanage. 6.vii.53.

VANESSA ANTIOPA LINN.: MIGRANT OR STOWAWAY?—In reply to Dr. E. A. Cockayne's criticism of my theory about the Camberwell Beauty arriving in this country as a stowaway rather than as a migrant I would like to clarify some points. I say, in my book *Butterfly Farmer*, that I watched these butterflies being disturbed from the wood stacks in early autumn. Unfortunately I omitted to mention the date and Dr. Cockayne took this to mean September or early October. In fact it was late August, which in Finland and also in Sweden is counted as early autumn. Hard frosts are usually expected in September and the Camberwell Beauty, which like its close relation the Large Tortoiseshell in this country, is an early hibernator, settles down in its winter quarters about the end of August. My contention is this; why should a butterfly, which in its native habitat has already gone into hibernation, or is on the point of doing so, be suddenly seized by an irresistible urge to travel hundreds of miles across the sea to this country? I still feel sure that at least the great majority of Camberwell Beauties found here in the autumn have been disturbed from their "beauty sleep" on board ships, and once here, particularly if the weather is fine and warm, they might very well wake up again for a time and continue flying instead of immediately going back into hibernation again.

There is certainly no question either of the butterflies "flying down to the docks" to wait for shipment. Much of the timber is not loaded at the docks at all but collected by the ships from various points along the coast where the forest comes almost down to the shore as I thought the photographs in my book clearly showed. This is the kind of locality where salallows grow and the butterflies breed. I did not intend to suggest that 1935 was a specially good Camberwell Beauty year just be-

cause I happened to make this observation then. It does not follow that because I noticed a number of *V. antiopa* in one particular locality they were plentiful throughout Scandinavia, but it is surely a lucky coincidence for me that the few *V. antiopa* seen that year were in the Tyne Valley, as Tyneside is one of the ports I mentioned. The sporadic appearance of *V. antiopa* can surely be explained quite simply. In Scandinavia you get good and bad Camberwell Beauty years just in the same way as *Vanessas* fluctuate over here. It would have to be an exceptionally good year for a number of the butterflies to arrive here safely. A Finnish entomologist with whom I have been in touch has told me that during the last few years *V. antiopa* has been very scarce in that country owing to a succession of cold wet summers. As far as Sweden and Norway are concerned I have no information, but possibly the situation there has been the same.

Frankly, I disbelieve many of the very early records about *V. antiopa* having been seen in swarms. It would need a credulous person to believe that they were ever as common as Cabbage Whites, even as far back as 1789—this would mean they were in millions all over the country! Even to-day, with Nature Study in every school, eight out of ten people don't know the difference between a Red Admiral and a Peacock and I imagine that quite a few of the so-called Camberwell Beauties may have been Peacocks.—L. HUGH NEWMAN, The Butterfly Farm, Bexley, Kent.

[Many of the *antiopa* caught in the eastern counties have the white or pale cream border characteristic of the northern race and show a structural abnormality of the scales as I pointed out in *The Entomologist's Record* in 1921. 33: 205-210. In my opinion they are migrants from Scandinavia, probably from Norway or Sweden. Mr. Newman postulates that they have come by boat from Finland. There is not a jot of evidence for this. Does Mr. Newman suggest that of the *antiopa* caught in 1872 "quite a few . . . may have been peacocks"? If so, the suggestion is a very silly one and would not have been made if he had read the contemporary journals.

In his rejoinder he does not answer the most important question: when were pit-props first imported? I suspect home-grown timber was used in 1800 and possibly in 1872. The onus is on Mr. Newman to show that at those dates pit-props were imported from Finland. If he cannot do so his theory falls to the ground. The Customs and Excise Department Statistical Office informs us that the first mention in their records of pit-props being imported from Scandinavia is 1901.—ED.]

CORRECTIONS.—*Ent. Rec.*, 1953, 65: 163. *Coenotephria derivata* Schiffermüller (synonym *nigrofasciaria* Göze). Ab. *nigrofasciata* Cockayne was a slip for *nigrocinctata*, but unfortunately *nigrofasciaria* Göze is a specific name and the aberrational name being of infraspecific rank is valid and no alteration can be made.

Hydriomena ruberata Freyer ab. *constricta* Löberbauer, *Z. Wien. ent. Ges.*, March 1953, 38: 20. Pl. i, row 6, 2 figures. This has priority over ab. *constricta* Cockayne, *Ent. Rec.*, June 1953, 65: 166.

ERRATA.—*Ent. Rec.*, 1953, 65: 2. *Arctia caja* L. ab. *septata* Gordon Smith. In the 'Explanation of Plate I', fig. 3, 'septa' should be *septata*.

VAPOURER MOTH ADAPTATIONS AND THE APTEROUS STATE.—I much regret that by an oversight I omitted to thank Mr. Russell Hudson of Fish Hoek, Cape Town, for his help in the collecting, counting, and breeding of *Bracharoa dregei* in my paper in the July-August issue.—H. B. D. KETTLEWELL.

THE AMATEUR ENTOMOLOGISTS' SOCIETY will hold its Annual Exhibition at Buckingham Gate Central Schools, Wilfred Street, London, S.W.1, on Saturday, 19th September 1953, from 2 to 5.30 p.m. Admission is free and everyone interested in Entomology will be welcome. Further particulars may be obtained from the Hon. Meetings Secretary, 19 Hengist Avenue, London, S.E.12.

Neuroptera and Trichoptera at Symonds Yat

By A. F. PEACEY, F.R.E.S.

Symonds Yat is situated on the boundary between Gloucestershire and Herefordshire, at a point where these two counties are separated from the county of Monmouth only by the river Wye. In many old collections specimens are merely labelled "Symonds Yat", thus presenting a problem to the county recorder, since the insects in question may have been taken in either of three counties and may be reasonably expected to occur in all of them. This applies with particular force to the Trichoptera and other aquatic and semi-aquatic Orders which one can hardly expect to find on one side of the river and not on the other, since their early stages are actually passed in the water between.

For the benefit of scrupulous county recorders I will state here that all insects mentioned in this note were actually taken within the county of Gloucestershire.

On 13.vi.53 I paid a short but interesting visit to this area, reaching the well-known Yat rock about mid-afternoon. From a small group of pine trees a number of caddis flies were obtained. These belonged to three species, namely, *Cheumatopsyche lepida* Pictet., *Psychomyia pusilla* Fabr. and *Limnephilus sparsus* Curt.

An isolated hawthorn bush produced one specimen of *Hydropsyche pellucidula* Curt. and a small swarm of the Neuropteran *Chrysopa ciliata* Waes. The only other Neuropteran taken, *Hemerobius micans* Oliv., was obtained in some numbers from beech, as were several more specimens of *Psychomyia pusilla* Fabr.

Leaving this elevated position, I made my way down to the river, reaching the bank a short distance below the rapids. From the alder bushes at the water's edge I disturbed countless numbers of caddis flies, securing specimens of *Silo pallipes* Fabr., *Goera pilosa* Fabr., *Sericostoma personatum* Spence., *Polycentropus flavomaculatus* Pictet., *Rhyacophila dorsalis* Curt., *Leptocerus cinereus* Curt. and an odd specimen of *Cheumatopsyche lepida* Pictet. This insect was very scarce, only three specimens being taken, all of the male sex.

Sweeping herbage at the water's edge produced two specimens of *Lepidostoma hirtum* Fabr. both females, and a few *Mystacides azurea* L. The apparent scarcity of this species, usually so abundant wherever it is found, was so marked that I made a careful search for it, but without success, only five specimens being taken. As I worked upstream towards

the rapids, odd specimens of *Chimarra marginata* Linn. occurred from time to time in the sweeping net. These became more numerous as I approached the rapids and were at rest in vast numbers on the sedges actually bordering the fast water. This was by far the largest number of caddis flies I have ever seen at one time. Some idea of the numbers present may be gained from the fact that one sharp stroke with the net secured no less than ninety-three specimens. For about twenty yards the sedges were covered with the insects and then, above the rapids, were clear again, only an odd specimen occurring from time to time in the net. I was now approaching the county boundary and ceased collecting at that point, having, in a little under two hours, taken specimens of thirteen species of Trichoptera and two species of Neuroptera.

DIPTERA

The Pinning and Setting of Flies

By E. C.M. D'ASSIS-FONSECA.

The question of setting Dipterous specimens has been and still is the subject of a certain amount of controversy, although the arguments for and against do not so far appear to have found their way into print. The writer has had a good deal of experience in attempting to identify specimens which have been treated to varying degrees of setting, or the lack of it, and this experience has shown without any possible doubt that, except perhaps in the hands of the expert, a properly set specimen has the greatest chance of being correctly determined.

The decision as to how much setting is to be done to a collection of Diptera will probably depend upon the amount of time which is available for the particular study in hand. Accordingly the quantity of material required for any given study will be the first consideration, and one of the principal factors in time expenditure will be the collecting of this material. Nevertheless it will still pay to adopt some standard of setting, for it may be safely assumed that if the specimens are merely impaled on pins, a practice all too common to-day, the time thus saved will be more than offset by the difficulty and uncertainty which will be experienced when it comes to identifying the species.

The need for a certain standard of setting applies most particularly perhaps to the Muscidae (incl. Anthomyidae). The identification of the species of this difficult family, and more particularly of the sub-family Anthomyinae, is based very largely on the leg bristles, and unless the legs are properly separated and correctly positioned, so that all surfaces of femora, tibiae and tarsi are able to be examined, considerable difficulties may be experienced when a specimen is to be determined. This does not mean that the necessity for setting ceases at the Muscidae; the same principle applies to the whole of the Brachycera and Cyclorrhapha, and to at least the Bibionidae and Scatopsidae of the Nematocera.

Owing to the relative importance of different characters in different groups of the Diptera, it might be argued that the *degree* of setting to be adopted could be made to suit the particular specimen concerned. But this presupposes that the identity of the fly, and therefore the

characters by which it is identified, are already known—in other words, that one is already an expert! It is therefore advisable to adopt one standard of setting for all specimens, and to suit that standard to the most exacting of the groups—the Anthomyiinae.

Having, as it is hoped, established the desirability of a certain standard of setting, a word or two on the method by which this may be achieved will not come amiss. Firstly, no specimen should ever be mounted by gumming to card or celluloid strip. Apart from the fact that portions of the specimen thus mounted are bound to be hidden from view, a gummed specimen can never be relaxed should this become necessary at some later date. All specimens should be pinned. Secondly, only stainless steel pins should be used for mounting. Any other kind of entomological pin, whether enamelled steel, or plated or enamelled brass, is liable to cause ruin to a valuable specimen by corrosion. The truth of this may be observed by examining almost any of the older collections of Diptera in the country. Stainless steel pins may be obtained from several of the well-known entomological dealers, and are available in a good selection of thicknesses and lengths.

Before attempting to set a specimen it is as well first to ensure that it is in proper condition, *i.e.* fully relaxed and with no “spring” in the joints of the various segments. This condition is best brought about by keeping the specimens for a certain period, spread out on a strip of newspaper or thin blotting-paper, in a laurel tube. The tube should be laid on its side with the paper strip in contact with the glass only, to avoid the absorption of too much moisture from the laurel. The length of time required to condition specimens depends mainly on their size. The smallest, such as small Dolichopodids, Ephydrids, Sphaerocerids, etc., may be set after 24-48 hours, while large specimens, such as the larger Tabanids, Syrphids, Tachinids, etc., may be left as long as 4-5 days under these conditions. It will be found that certain thickly pollinose flies, even though of medium size (*e.g.* the females of some species of the Muscid genus *Helina*) tend to become “wet”, and consequently spoiled, if left in the laurel tube for more than one or two days, but the collector will very quickly learn by experience which species are likely to need more careful treatment in this respect.

When the specimens are in the right condition, the setting may be carried out as follows:—

1. Select a stainless steel pin of suitable size and insert it through the thorax slightly behind the transverse suture and to one side of the centre line of the insect. This ensures that the bristles on at least one side will be left intact. If the pin is correctly inserted, perpendicular to the plane of the insect, it will come through about half-way down the sternopleuron (the triangular plate immediately above the middle coxa).
2. Insert the pin, with the fly mounted on it, squarely into a plain (ungrooved) sheet of papered cork of such a thickness as to ensure the desired length of pin beneath the specimen. Arrange the specimen with its under surface slightly above the setting-board.
3. With a needle or fine pin pull the legs out from underneath so that they lie in a more or less natural position, with the middle legs pointing somewhat forward. At this stage do not use any pins to keep the legs in position.

4. Insert a pair of pins in the board so that they cross beneath the abdomen towards its tip, supporting it in a horizontal position. This abdomen support will also help to steady the specimen as setting proceeds.
5. Insert a pin at a point to the side of, and about level with, the tip of the abdomen, slanting forward at an acute angle to the setting-board so that it lies across and above the wing near to its base. Insert another pin a little further out than the first, and at about the same angle, but this time *beneath* the wing. The relative heights of the two pins to each other and to the insect must be such that, when the wing is drawn forward by a setting-needle, it lies snugly and horizontally between the pins and remains in a position about 90° to the axis of the fly. If the upper pin is too low or the lower one too high the wing will be bent where it lies between the pins. If, on the other hand, the upper one is too high or the lower too low the wing will not remain in the required position. The aim should be to fix each wing more or less horizontally, or slightly inclined upwards, so that it does not obscure any of the pleural characters.
6. Finally, ensure that the legs do not move during drying by inserting pins in the board where required. Each specimen should remain on the board for about a month before the setting pins are removed and the specimen labelled and transferred to a store-box to await identification.

NOTE: For all specimens up to medium size (*e.g.* *Phaonia errans* Mg.), No. 20 white pins should be used throughout for setting; for larger specimens use No. 20 pins for everything except the wings, for which No. 8 or No. 17 white pins may be used according to the size of the specimen.

The above six paragraphs describe briefly the basic procedure for setting, but after some practice a collector will no doubt adopt his own particular variant of the described method. It will be found by experience that certain families or groups of species require additional manipulation in order to expose special characters. For example, in the Tachinidae, Calliphoridae and Muscidae *sens. lat.* the proboscis should be pulled downwards sufficiently to bring the palpi into view, and the antennae lifted away from the face and slightly separated from one another so that the inner surface can be examined. Similarly, the male genitalia of all species of the above three families should be drawn out so that they remain exposed when the specimen is dry. These three operations are most easily performed after the mounting pin has been inserted in the specimen, but before pinning it to the board. It will probably be found necessary to use one or two suitably placed pins to keep the genitalia exposed while the specimen is drying.

In conclusion, it may be safely asserted that setting will, almost certainly, be a tedious business at first, and any collector who decides to give it a trial may well wonder if the results are worth the effort. Anyone, however, who has experienced the exasperation, caused by failure to reach a definite conclusion because vital characters are completely obscured, will appreciate the value of good setting. It must be remembered that, once a specimen has become dry and brittle, any attempt to remove an obstruction, in order to bring some hidden surface or character into view, will probably result in irreparable damage.

Protocalliphora azurea Fall. in Birds' Nests with a Record of the Killing of Magpie Nestlings by the Larvae of this Fly

By D. F. OWEN.

At Wytham in Berkshire in 1953 I examined the nests of 21 great tits *Parus major*, 12 blue tits *P. caeruleus*, 1 coal tit *P. ater*, 1 marsh tit *P. palustris* and 2 redstarts *Phoenicurus phoenicurus* for the larvae or pupae of *Protocalliphora azurea*. Only one nest, a great tit's, was found to contain pupae (15) and there was no indication that the nestlings had suffered by the presence of this species. In 1952 in the same area 20 nests were found to contain pupae (1953, *Ent. Rec.*, **65**: 31-32). Near Wytham a nest of a whitethroat *Sylvia communis* contained two pupae from which flies eventually emerged.

At Wytham a brood of magpies *Pica pica* hatched on 20th May. The smallest of the three was found dead on 4th June and the second young died on 7th June. An examination of the exposed part of the stomach of the remaining bird revealed six larvae firmly attached to the skin. There were also traces of blood and the skin appeared hard and dry. The larvae were removed, but when the nest was visited about an hour later more were attached to the stomach. On 9th June this bird was found dead and an examination of the base of the nest revealed about 250 *Protocalliphora* larvae among the twigs and hair. I should add that there is little doubt that this fly was the cause of death as food was not short; other broods of magpies in the area survived. Also both parents were seen alive after the death of the nestlings.

Both magpie and whitethroat are additional to Audcent's list of the hosts of this fly (1942, *Trans. Soc. Brit. Ent.*, **8**: 1-42).

Phaonia laetabilis Collin and other bred Diptera

By B. R. LAURENCE.

Mr. E. C. M. d'A. Fonseca has recently been good enough to look through some Muscidae bred from larvae and puparia collected in Rothamsted Manor Wood, Herts., in 1951. Notes on these and some other species are given below. The breeding jars were kept in a large unheated room. The date of emergence is given immediately after the number of each species bred.

Phaonia laetabilis Collin, 2 ♀♀ (3/viii/51) bred from puparia found in wet material in a rot hole of silver birch, collected 19/vii. *Aulacigaster leucopeza* Mg., 1 ♂ also emerged from a puparium found at the same time.

Phaonia scutellaris Fall., 1 ♀ (28/v/51) from the fungus *Polystictus* growing at the end of a cut trunk. Larva collected 30/iii in company with larvae of *Limonia decemmaculata* Loew, 9 ♂♂, 6 ♀♀ (21/v-2/vi/51).

Phaonia variegata Mg., 14 ♂♂, 8 ♀♀ (5/v-17/v/51) from puparia collected 24/iii in wet and dry wood of a decayed tree stump. One male showed the "hemithorax" condition (not inherited) recorded in labora-

tory bred *Drosophila*. 4 ♂♂, 2 ♀♀, of *Hydrophoria linogrisea* Mg. (3/v-7/v/51) also bred from puparia in stump (see Fonseca 1952, who suggests this species may be a variety of *H. conica* Wied.).

P. variegata, 2 ♂♂, 2 ♀♀ (14/v-29/v/51) also bred from decayed horsechestnut husks. Larvae (23/ii) in company with numerous larvae of *Anisopus fenestralis* Scop. (1/v-14/vi/51). *Lonchoptera lutea* Panz., 1 ♂ (1/v/51), found as a larva, and 1 ♂, 1 ♀ of *Docosia gilvipes* Hal. (10/v/51) also emerged. Edwards, 1924, records *D. fumosa* Edw. as saprophagous.

Fannia sociella Zett., 1 ♂ (26/v/51) from puparium collected 27/iii/51 in dry earthy material in crevice of cut willow trunk. *Cerotelion lineatus* F., 1 ♂ (5/vii/51) emerged from salmon red larvae found in slime tubes in cracks in the trunk. One larva ate a pupa of the same species.

Helina impuncta Fall., 1 ♀ (4/vi/51), from larva collected 27/iii/51 in spruce litter around loose bark of a spruce stump. Numerous *Sciara* larvae also present, and one larva of *Leptis (Rhagio) scolopacea* L., 1 ♀ (2/vi/51).

Two larvae of *L. scolopacea* (larvae white, with blood red internal organs) were found beneath bark of deciduous tree stumps. 1 ♂ emerged 29/v/51 having pupated at about 1/v/51.

A male *Rhamphomyia nigripes* F. emerged 22/v/51 (pupated about 1/v/51) from a larva found in moss and liverworts on a very wet stump on 16/iv/51. 5 ♂♂, 2 ♀♀, *Tipula staegeri* Nielson emerged 20-21/ix/51 from larvae collected at the same time.

Most of the species above overwintered therefore as larvae.

REFERENCES.

- Collin, J. E., 1951, *Phaonia laetabilis* sp. n. with notes on some other related Anthomyidae (Diptera). *Ent. Rec.*, **63**: 1-5.
 Edwards, F. W., 1925, British Fungus-Gnats (Diptera, Mycetophilidae). *Trans. R. ent. Soc. Lond.*, **1925**: 505-662.
 Fonseca, E. C. M. d'Assis-, 1952, Translation of "A survey of the Swedish species of *Hydrophoria* and *Acroptena* (Dipt., Muscidae)" by O. Ringdahl. *J. Soc. Brit. Ent.*, **4**: 75-83.

Fifty Years Ago

(From *The Entomologist's Record* of 1903)

HABITS OF *APATURA IRIS* L.—Dr. Norman H. Joy exhibited specimens of *Apatura iris* from the neighbourhood of Reading, captured in 1901. . . . he said that, with Mr. Lee, he took altogether fourteen specimens, all males, eleven of them from the three top branches on the north side of a beech tree. No females were seen, in fact it appeared to be the throne of the ruling "Emperor" of the wood. Whenever another *iris* came by, the one on the "throne" attacked it, and, after a fight in which one would eventually pursue the other out of sight, one of them would return to the perch. If this specimen was captured the next *iris* coming along would take possession of the throne, and so on, so that five were taken in one afternoon off the same tree. When on the throne they were extraordinarily confident, as more than once the chosen branch was struck hard without disturbing them, yet if one happened to settle on a lower branch, the slightest movement even of the hand frightened it away at once.

RATS AND MOTHS.—I see no special mention [in the *Proc. ent. Soc. Lond.* for this year] of one great enemy to insects here [Durban, Natal] . . . I refer to the ordinary and very common grey South African rat, which is one of the most dreadful pests to the breeders of butterflies and moths that I know of. These rats seem to be particularly fond of almost any pupae, and I have had thick wooden boxes containing pupae eaten right through, and the contents all devoured. They are especially fond of *Chaerocampa eson* and *C. nerii*. Even more remarkable than their keenness in hunting pupae is the way in which they capture moths on the wing whilst feeding. Over the verandah of my previous residence here I had a large honeysuckle upon the blossoms of which a great number of Sphingid species used to feed. Whilst I have been watching them just at dusk, all of a sudden I have heard a rush and down came a rat from the roof right on to the plant, and more often than not the moth selected for attack was captured, usually followed by a fight amongst the rats over the prize. The moths I have seen captured in this way are *Sphinx convolvuli*, *Nephele variegata*, *Chaerocampa eson* and *C. celerio*. The first named is the most successful in escaping, owing to the long proboscis which compels it to hover at some distance from the blossom. *N. variegata* is probably the swiftest flier, but it is more conspicuous owing to its dark colour.—G. F. LEIGH.

LIVENING UP THE ENTOMOLOGICAL SOCIETY.—Professor E. B. Poulton is to be the next president of the Entomological Society of London, and possibly no more popular choice could have been made. Even those who disagree with his theories cannot but admire his energy and the cool certainty with which he advances the most remarkable views, and the *ex cathedra* way in which he occasionally lectures those who disagree with him. His lectures on the proposal to amend the byelaws have been charming, but we do sincerely hope that he will put aside for ever the notion that Fellows who hold a different opinion from the Council are censuring the Council by giving effect to their own opinion. One thing is certain, there will be some life at the meetings of the Entomological Society of London in the immediate future.—J. W. TUTT.

Current Literature

THE DISTRIBUTION OF THE NORTHERN DART, AGROTIS HYPERBOREA ZETTERSTEDT, ON THE MAINLAND OF SCOTLAND. . . By Kenneth Tod. *The Scottish Naturalist*, 65: 11-18.

This species is more correctly designated *Amathes alpicola* Zett.: the larva alone distinguishes it from an *Agrotis*. The author copies all the text books and gives the date of the first capture in Scotland as 1839 though Douglas in the original account gives 1838. The discovery of a pupa by J. S. Allin (*Scottish Nat.*, 1873, 2: 162) "last July" he takes to mean July 1873. The letter is not dated, but others before and after it are dated August 1873, March 1873 and August 1873. It is probable that "last July" means July 1872 and that both these early records refer to even years and are not exceptions to the rule that the moth only appears in the even years.

The most important part of the paper is that on its distribution. The author failed to find it in Wester Ross or Sutherland, where the summits were too grassy and the areas of suitable ground too small to

support the species. He found it in the Angus Mts., which lie between Glen Callater and Clova, and are very inaccessible. Plants found nowhere else in Scotland have been found there recently and so far as I know they have never been explored by an entomologist. He found *alpicola* not uncommon on one summit, others examined were too grassy. The form differed appreciably from the Rannoch form and from that found on the Monadhliath mountains of Inverness-shire. The author says that individuals occur which might have come from any locality, but in a series the Rannoch specimens are more rosy, the Monadhliath darker and marked with a great deal of black and light blue, and the Angus ones are browner, but the black and white figures do not bring out these differences in colour.

The methods of collecting which Mr. Tod gives are not new. The fact that the well-drained edges of sheep and deer paths were the best places to search for pupae was known to the professional collectors and I was told about it more than fifty years ago. His discovery that on the drier Angus Mts. it pupates in the dips in the ground was unknown previously.

He has exaggerated ideas of the danger of over-collecting. *A. alpicola* is subject to remarkable fluctuations in numbers and is now at the beginning of another period of scarcity. No doubt it will become abundant again in a few years. A Proctotrypid which laid its egg in the newly-formed pupa and multiplied by polyembryony was supposed to have caused the scarcity at Rannoch, but it was not found in the Monadhliath Mts. when it became scarce there, nor were the parasites of the large larvae unusually common. Nothing is known about the parasites of the small larvae found in the odd years. Here is something for the enterprising author of this interesting paper to investigate.

E. A. C.

THE ADAPTABILITY OF THE HOMECOMING HONEYBEE. By C. R. Ribbands and Nancy Spiers. *The British Journal of Animal Behaviour*, 1: 59-66.

It is well known that vision is of prime importance in the orientation of honeybees to their hives. In this paper the authors describe experiments which were conducted in order to study the behaviour of bees when the position of their hive entrance was changed, especially to discover how quickly they became adapted to the new conditions and to determine whether individual age affected their ability. It was found that bees re-orientated completely on the first visit and even more rapidly on subsequent visits, and that age was unimportant. In this short notice it is impossible to describe other aspects of the experiment adequately and readers interested are referred to the original paper, which also contains a good bibliography.

D. F. O.

THE RED-BANDED LEAF-ROLLER AND ITS CONTROL. By E. H. Glass and P. J. Chapman. New York State Agricultural Experimental Station. Bulletin 755. Oct. 1952.

This Tortrix, *Argyrotaenia velutinana* Walker, has been a minor pest of apples and other fruits in the eastern apple-growing areas for many years, but suddenly became a major pest of apples in 1946 and sub-

sequent years. It is believed that the use of D.D.T. instead of lead arsenate was the cause. D.D.T., timed and applied to control the codlin moth, was not so effective an insecticide and is highly toxic to the common parasites of the leaf-roller, thus favouring the leaf-roller in two ways. This shows that insecticides may upset the balance of nature disastrously even when they are used with care. Again and again entomologists have called attention to the danger of using insecticides and weed killers indiscriminately. Some of the modern weed killers destroy every living thing in a field—pheasants, partridges, small birds and insects of every kind, and sometimes the man who sprays the field dies of the poison. No doubt we get more food for the first year, but are the unknown risks worth taking?

E. A. C.

THE SOCIAL INSECTS. By O. W. Richards. Published by Macdonald & Co., Ltd., London, at 15s.

Besides providing an admirable review of our present knowledge of the social insects, which will be of considerable value to the serious entomologist, the author of this book, who is well known for his work on the Hymenoptera, has presented his material in a style which the layman can read with ease and enjoyment. The introductory chapter is devoted to a brief account of the general physiology of insects and the development of social behaviour. Then follow chapters on the behaviour and social organisation of wasps, bees, ants, social parasites and termites. In the final chapter there is an interesting discussion of the evolution of social behaviour in insects and comparisons are made between the ways by which they and man have overcome certain problems common to both. Throughout this book the emphasis is on experimental study and the author frequently stresses the need for much more of this, making suggestions for future work. There is also much to interest the ethologist and the ecologist. The book concludes with a short list of works for further reading and a good index. In the reviewer's opinion, a more comprehensive bibliography would have been a useful addition for the benefit of those readers who will wish to pursue the subject further. The photographs and line drawings are excellent and appropriate to the text.

J. F. B.

TWO SPECIES OF CALLIPHORA FROM THE ABERDEEN DISTRICT. By E. G. H. Lightfoot. *Scottish Naturalist*, 65: 50.

Two flies, *Calliphora loewi* and *C. uralensis*, were found near Aberdeen in 1949 and 1952. Both are regarded as rare in the north of Scotland.

D. F. O.

ADDITIONS TO THE LEPIDOPTERA AT ULVERSTON. By Neville L. Birkett. *The North Western Naturalist*, June 1953, 1: 293-295. (New Series).

Twenty-seven additions to the author's previous list of the Lepidoptera of Ulverston (Lancashire) (*N.W.Nat.*, 17: 37). There is a single record of *Ortholitha scotica* Ckyne. Much further work is needed to work out the distribution of the species listed.

D. F. O.

LANCASHIRE AND CHESHIRE ODONATA (A PRELIMINARY LIST). By W. K. Ford. *The North Western Naturalist*, June 1953, 1: 227-233. (New Series).

Twenty-three species of dragonfly have been recorded from the counties of Lancashire and Cheshire. *Erythromma najas*, *Libellula quadrimaculata*, *L. depressa* and *Coenagrion pulchellum* are regarded as uncommon and *Brachytron pratense* seems to reach its northern limit in Cheshire and south Yorkshire. The only recent records of *Cordulia aenea* and *Cordulegaster boltonii* are from the Lakes area and *Sympetrum danae* has possibly decreased as a result of a reduction of its habitat. There is one record of *S. fonscolombii* and *S. flaveolum* is rare. The old record of *Ceriagrion nymphula* is rejected.

D. F. O.

Obituary

PHILIP PERCIVAL GRAVES died, aged 77, at Ballylickey House, Bantry, Co. Cork, on June 3rd, 1953. He was educated at Haileybury and Oriel College, Oxford, and, from 1906 onwards, became well known as *The Times* Correspondent in the Near East. During the 1914/18 war he served with the rank of captain in the intelligence corps in Egypt, Arabia and Palestine, afterwards returning to the staff of *The Times* and travelling in Ireland, India, the Levant and the Balkans. He was the author of many books dealing with European and Near Eastern problems; his most spectacular work being a twenty volume history of the 1939/45 war, written volume by volume as the war progressed.

It was during his many travels that Philip Graves developed a great interest in entomology generally and Lepidoptera and Odonata in particular. At different periods he collected butterflies in Palestine, Cyprus, Bulgaria and Egypt, also in England, and from time to time contributions from his pen appeared in the entomological press.

When, in 1945, he retired to Ballylickey near Bantry in Co. Cork, he was at last able to give up a considerable part of his time to entomology and he devoted himself particularly to the study of Irish butterflies. Previously, on a former visit to Ireland, he had been greatly struck by the marked difference between the Irish form of *Maniola jurtina* L. and the normal English form and, in 1930, he had described and named the Irish form as ssp. *iernes* (*Entomologist*, 63: 49). It is hoped that his Irish butterflies will be added to the collection in the National Museum in Dublin.

The number of serious entomologists in Ireland is small and Philip Graves will be sadly missed by those who remain. He was a delightful colleague in the field and, indeed, a charming companion at all times. His memory and his knowledge of world affairs were remarkable and these, combined with his unfailing sense of humour, made him a conversationalist of outstanding character. During the last two years of his life his outdoor activities had been greatly restricted by failing health, but his interest in entomology continued up to the end.

Philip Graves had been twice married, first in 1912 to Leila Millicent Knox, by whom he had a daughter, and secondly in 1935 to Mrs. Katherine Eleanor Dewar, who survives him, and to whom our deep sympathy is extended.

E. S. A. B.

Further Observations on Hybrid Swallowtails

By C. A. CLARKE and P. M. SHEPPARD.

In November 1952, using the technique of hand-mating (described in *Ent. Rec.*, 64: 98), the hybrid between a female North American Black Swallowtail (*Papilio polyxenes asterius*) and a male Old World Swallowtail (*P. machaon*) was obtained. In February 1953 the reciprocal cross (*P. machaon* ♀ × *P. polyxenes* ♂) was also produced. The salient feature of both these hybrids was that they were black, in this resembling the American parent, but in addition they showed certain definite but less striking *machaon* characteristics.

Since that time it has been found possible to cross more of these North American Swallowtails and the following hybrids have now been obtained, all by hand-pairing.

- P. polyxenes* ♀ × *P. machaon* ♂.
- P. machaon* ♀ × *P. polyxenes* ♂.
- P. brevicauda* ♀ × *P. machaon* ♂.
- P. brevicauda* ♀ × *P. polyxenes* ♂.
- P. polyxenes* ♀ × *P. brevicauda* ♂.
- P. zelicaon* ♀ × *P. machaon* ♂.
- P. machaon* ♀ × *P. zelicaon* ♂.
- P. polyxenes* ♀ × *P. zelicaon* ♂.

RANGE AND BRIEF DESCRIPTION OF SPECIES. (*See map and plates*).

A. *P. machaon* L.

This insect occurs as various races throughout most of the Old World and extends across the Behring Strait into Alaska, Manitoba and Alberta where it is found in three or four sub-arctic forms. The butterfly is so well known that no detailed description is necessary. There are, however, certain special characteristics which deserve mention because of their importance when describing the hybrids.

1. Ground colour yellow.
2. There is no sexual dimorphism.
3. There is a smudge of yellow on the apex of the forewing on the under-side; this is formed by a powdering of yellow scales.
4. The legs are partly yellow.
5. The eye spot on the anal angle has a thin black posterior border.

6. There is very little or no orange in the four submarginal yellow lunules above the tail on the underside of the hind wings.
7. The full grown larva is green with black transverse bands broken up by a number of characteristic orange spots.

B. *P. polyxenes asterius* Stoll.

The distribution of this butterfly is from Quebec in the north to Louisiana in the south keeping east of the Rocky Mountains throughout its range. It is the Common Black Swallowtail of North America. The special features to be noted are:—

1. Ground colour black.
2. There is marked sexual dimorphism.
3. There is no smudge of yellow on the apex of the underside of the forewing.
4. The legs are black.
5. The eye spot on the anal angle has a round black central pupil.
6. The four submarginal lunules above the tail are almost entirely orange.
7. The full grown larva has yellow spots.

C. *P. brevicauda* Saunders.

This insect is found only in Newfoundland, Nova Scotia, Anticosti Island, Labrador and Quebec. It is a *polyxenes*-like butterfly but the yellow in it is more orange and the tails are very blunt and short. It also differs from *polyxenes* in that there is no sexual dimorphism. The larva resembles that of *polyxenes* in having yellow spots in the last instar.

D. *P. zelicaon* Lucas

This species occurs west of the Rocky Mountains ranging from British Columbia in the north to Arizona and California in the south. It is a large, striking, orange-yellow butterfly with heavy black markings, superficially resembling *machaon* more than *polyxenes* or *brevicauda*. The special characters to be noted are:

1. Ground colour orange-yellow.
2. There is no sexual dimorphism.
3. The apical smudge is present.
4. The legs are black.
5. The eye spot on the anal angle has a central pupil as in *polyxenes* and *brevicauda*.
6. The four lunules above the tail are almost entirely yellow.
7. The larval spots in the last instar vary between yellow and yellow-orange.

ANALYSIS OF THE HYBRIDS.

- I. *P. polyxenes asterius* Stoll ♀ × *P. machaon* L. ♂. (Called hybrid "O").

The special features to be noted are:

1. Ground colour black as in *polyxenes*.
2. There is marked sexual dimorphism.
3. The yellow smudge on the apex of the forewing on the underside is present but less marked than in *machaon*.
4. The legs are partly yellow but less yellow than in *machaon*.

- 5 The eye spot on the anal angle is intermediate but resembles the narrow marginal black arc of *machaon* more than the central pupil of *polyxenes*.
- 6 The four submarginal lunules above the tail are yellow streaked with orange.
7. The full-grown larva has orange spots.

Number of times hybrid obtained:—Five.

Numbers and sex ratio:—

		♂ ♂	♀ ♀
"O" 1	64	40	24
"O" 2	20	11	9
"O" 3	13	7	6
"O" 4	3	1	2
"O" 5	2	2	1

Length of life cycle at 70° F. from laying of first eggs to emergence of first insects:—33 days.

**Fertility*:—No fertile eggs have been obtained from numerous crossings *inter se*. A ♀ *P. machaon* mated with a ♂ "O" 5 laid 29 eggs of which 23 are fertile (9.8.53). Previous similar pairings have always been infertile and up to the present time no fertile eggs have been obtained from back crosses to *polyxenes*.

11. *P. machaon* L. ♀ × *P. polyxenes asterius* Stoll ♂. (Called hybrid "R").

Description. Similar to "O" but cross appears less fertile. Hybrid features as in "O", the yellow in the submarginal lunules being especially marked.

Number of times hybrid obtained:—Three.

Numbers and sex ratio:—

		♂ ♂	♀ ♀	Gynandromorphs.
"R" 1	7	2	5	
"R" 2	6	2	2	2
"R" 3	13	7	6	

Length of life cycle at 70° F. from laying of first eggs to emergence of first insects:—38 days.

Fertility:—Fertile F.1 matings have not been obtained from "R" hybrids *inter se*, nor from "O" × "R" matings ("O" ♀ × "R" ♂ and "R" ♀ × "O" ♂).

All possible matings have been done between "O" and "R", most of them several times, and all have proved infertile. With the back crosses, however, fertile eggs have been obtained on two occasions, once with a ♂ *polyxenes* and once with a ♂ *machaon*.

- a. *The Back Cross to Polyxenes*. (♀ "R" hybrid × ♂ *polyxenes*, March 1953).

Twenty eggs were obtained from this mating but only four proved fertile; from them four imagines were bred, all females. The

*In all cases infertility has only been assumed where the butterflies have been successfully hand-paired

- b. *The Back Cross to Machaon*. (♀ "R" hybrid × ♂ *machaon*, March 1953).

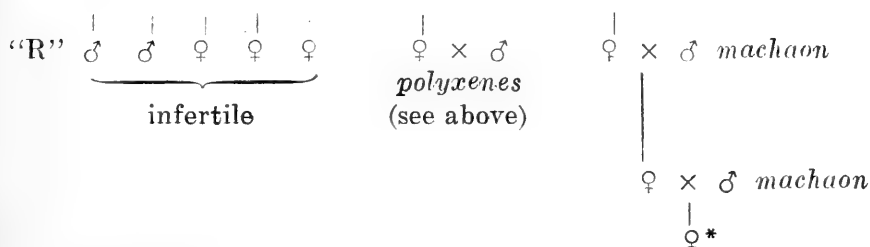
Six eggs were laid but only one was fertile. From this was bred a very large female butterfly resembling *machaon*, except that the anal spot was hybrid-like.

Length of life cycle at 70° F.:—37 days.

Larval spots in last instar:—Orange.

Fertility:—This butterfly was mated to a male *machaon* and laid ten eggs. Seven of these darkened but only one hatched. From this was bred a female butterfly the parentage of which is given below.

♀ *machaon* × ♂ *polyxenes*



**Description*:—Resembles *machaon*, except that the anal spot is hybrid-like. Normal *machaon* size.

Length of life cycle at 70° F.:—37 days.

Larval spots in last instar:—Orange.

Fertility:—Mated to male *machaon*. Laid about twenty-five eggs; most hatched but big larval death-rate from virus disease and only one pupa obtained (3.8.53).

III. *P. brevicauda* ♀ × *P. machaon* L. ♂. (Called "brevimach").

Description:—The male appears identical with the "O" or "R" hybrids. The black background of *brevicauda* replaces the yellow of *machaon* as does the black of *polyxenes*, but the specific *brevicauda* features (short tails and orange spotbands) have disappeared. The tails of the hybrid are long, the spotbands are of the *machaon* yellow, the anal spot is hybrid-like, the legs are partially yellow and the butterfly has the hybrid smudge. Sexual dimorphism is absent, in this differing from the "O" and "R" hybrids. The larval spots in the last instar are orange.

Number of times hybrid obtained:—Two.

Numbers and sex ratio:—

	♂ ♂	♀ ♀
"Brevimach" 1	1	—
"Brevimach" 2	—	2

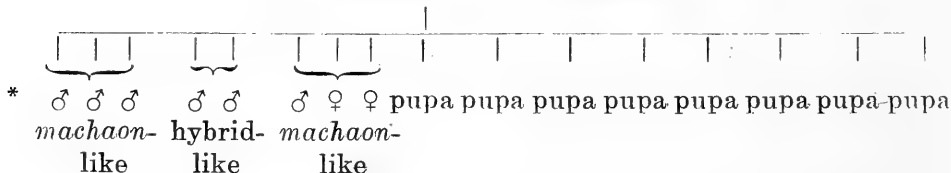
Length of life cycle at 70° F.:—38 days.

Fertility:—There have been no fertile eggs from an *inter se* pairing, but a fertile mating was obtained between the male "brevimach" and a female *machaon*. She laid about twenty-five eggs which were fertile except for two or three.

The Back Cross to Machaon. ($\text{♀ machaon} \times \text{♂ "brevimach"}$).

Result of this mating (in order of emergence:—

$\text{♀ machaon} \times \text{♂ "brevimach" 1.}$



**Description:*—It will be seen that among the butterflies that have so far emerged a clear-cut segregation has occurred in respect of ground-colour, the butterflies either looking like *machaon* (yellow ground colour) or like the hybrid (black ground colour). Two of the *machaon*-looking insects resembled *machaon* exactly; in the other four the anal spot was hybrid-like. Both black butterflies exactly resembled their hybrid father, except that in one the anal spot was *machaon*-like. No black females have yet emerged but there is no sexual dimorphism among the yellow individuals. The larval spots in the last instar are orange.

Length of life cycle at 70° F.:—39 days.

Fertility:—*Inter se:* a fertile brother-sister mating was obtained between the hybrid-looking male with the *machaon*-like spot and a *machaon*-like female. Four eggs were laid, two of which were fertile; the larvae from these died of virus disease when half grown. The same hybrid-looking male was also mated to a female *machaon*. She laid thirteen eggs, ten of which were fertile and from these four pupae have been obtained.

IV. *P. brevicauda* ♀ × *P. polyxenes* ♂. (Called "bras").

Description:—The male is very similar to *polyxenes*, the tails being long and the spotbands on the upper side yellow, thus markedly differing from *brevicauda* (see p. 2). On the underside of the forewing the orange inner spotband is broad as in *brevicauda*. In the female the orange has also given place to yellow and the spotband on both upper and underside is intermediate between that of *polyxenes* which is narrow and faint, and that of *brevicauda* which is broad and striking. The male and female hybrids are the same size, thus differing from *polyxenes*, and in general the sexual dimorphism is intermediate. The larval spots in the last instar are yellow.

Number of times hybrid obtained:—One.

Number and sex ratio:—

	♂ ♂	♀ ♀
15	7	8

Length of life cycle at 70° F.:—34 days. (Females emerged first).

Fertility:—No fertile eggs were produced from *inter se* matings. Two fertile back crosses were obtained with *polyxenes* and *brevicauda* females respectively.

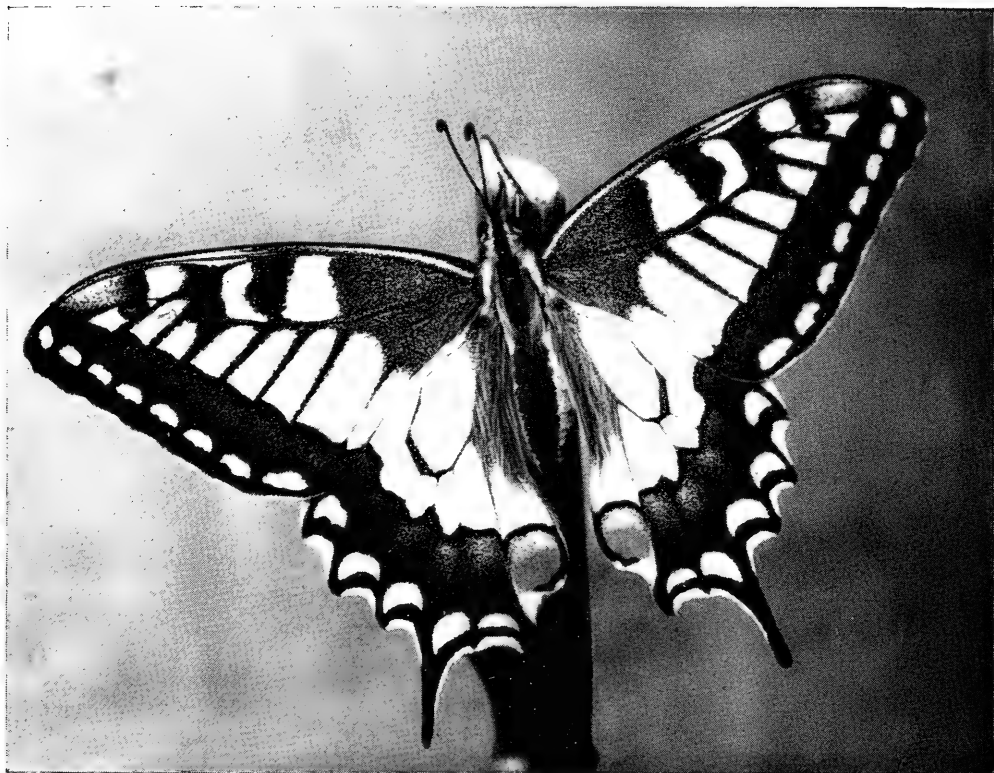


Fig. 1. ♂ *P. machaon*. The ♀ is similar.
Note light ground colour and character of anal spot.

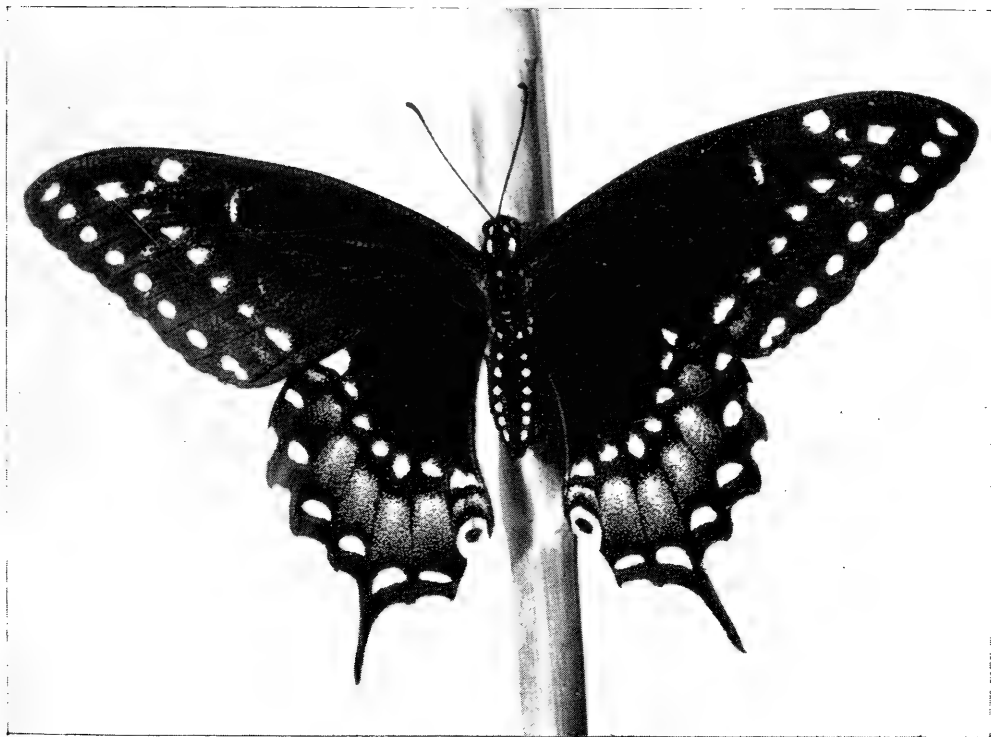


Fig. 2. ♀ *P. polyxenes*.
Note black ground colour and central anal pupil. The upper side of the ♂ *polyxenes* is similar to Fig. 3 except for the character of the anal pupil (see text). Marked sexual dimorphism.

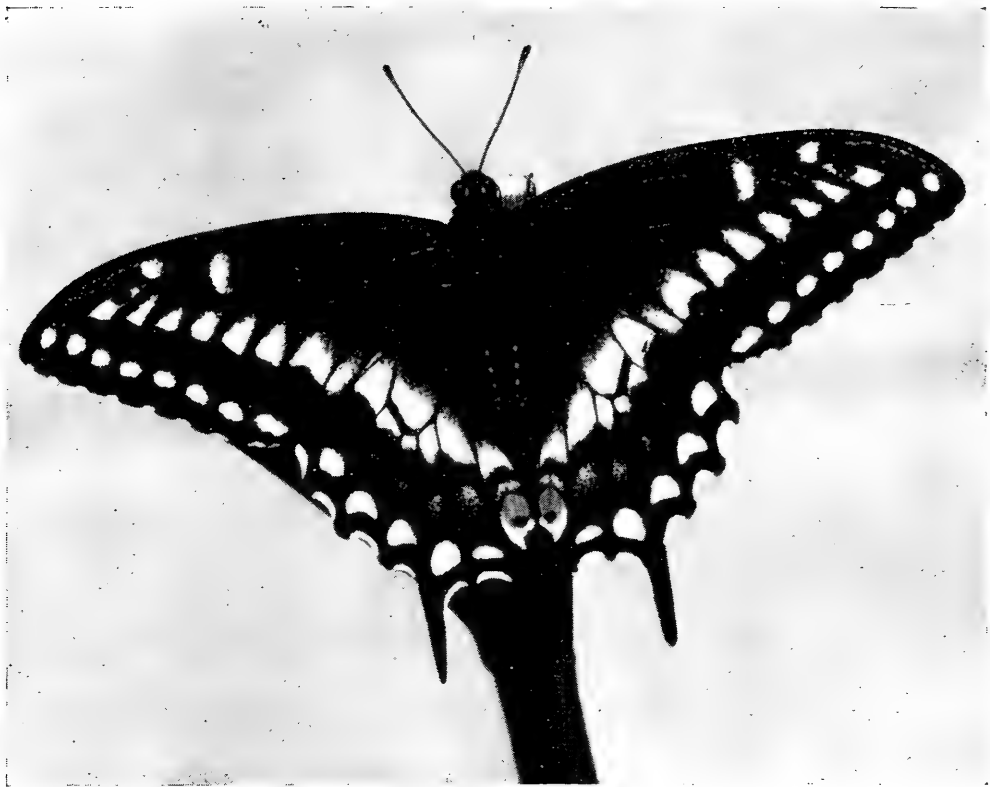


Fig. 3. ♂ "O" Hybrid.
Note character of anal spot.

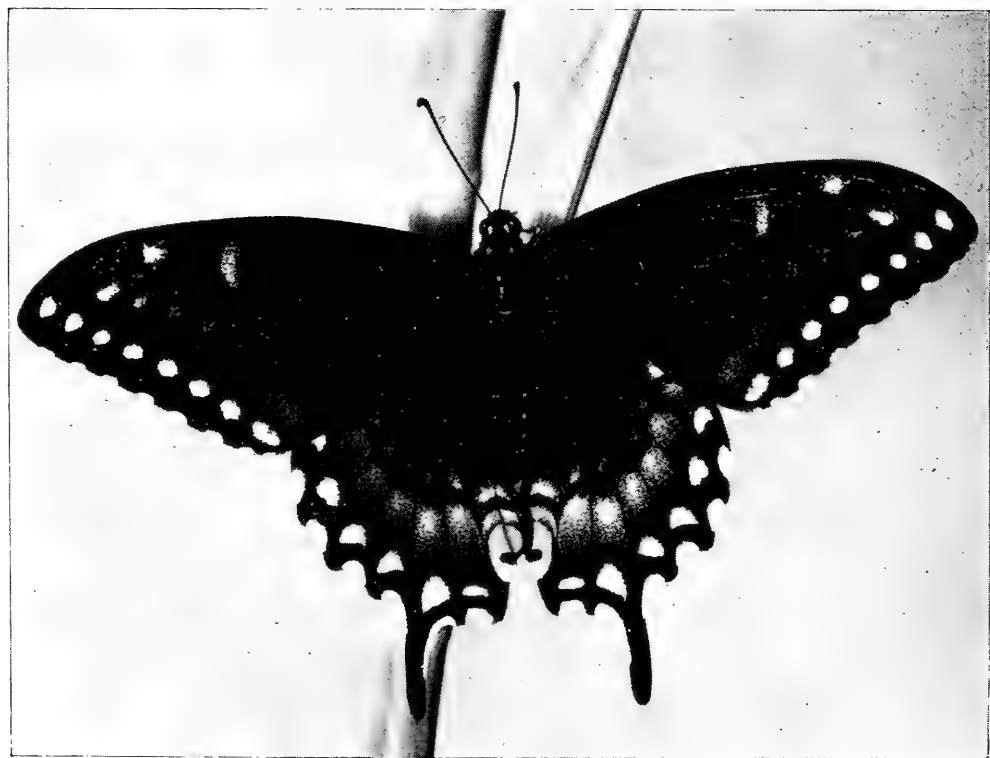


Fig. 4. ♀ "O" Hybrid.
Note sexual dimorphism and character of anal spot.

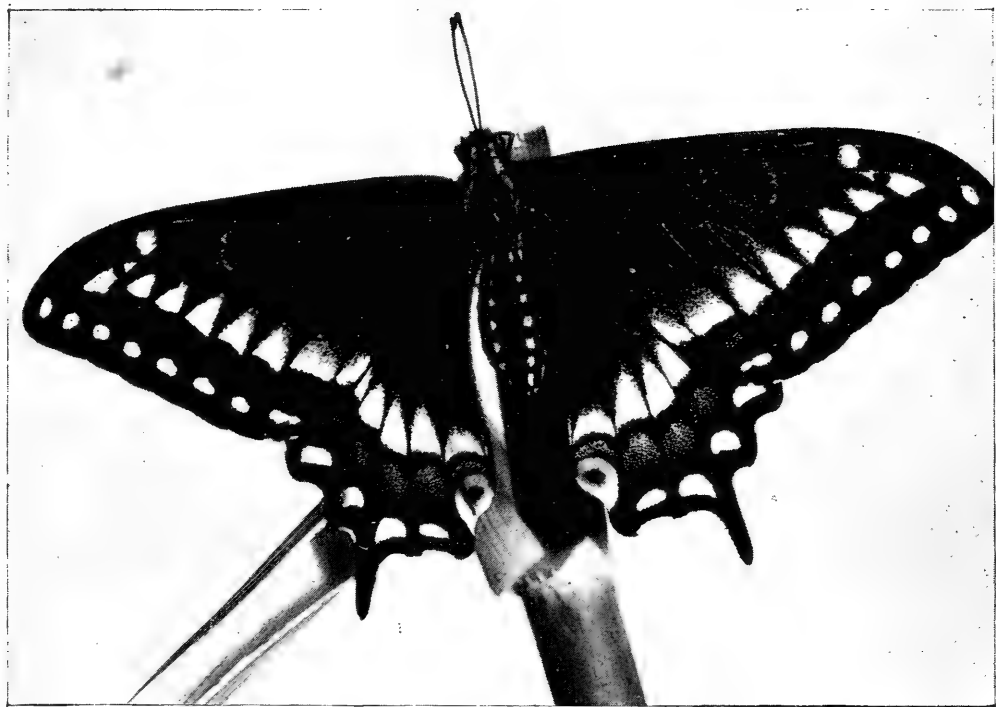


Fig. 5. ♀ *P. brevicauda*.

Note short blunt tails, wide inner spot-band, and character of anal pupil.
The ♂ is similar.

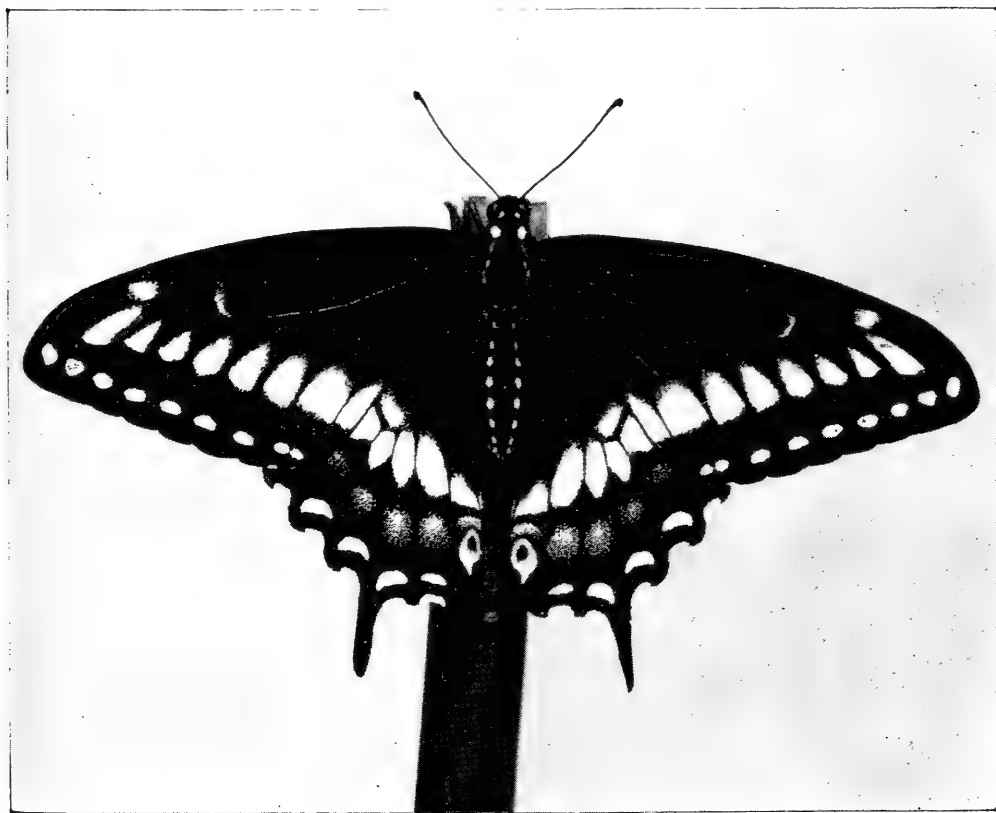


Fig. 6. ♂ "Bras".

Note wide inner spot-band as in *brevicauda* and long tails as in *polyxenes*.

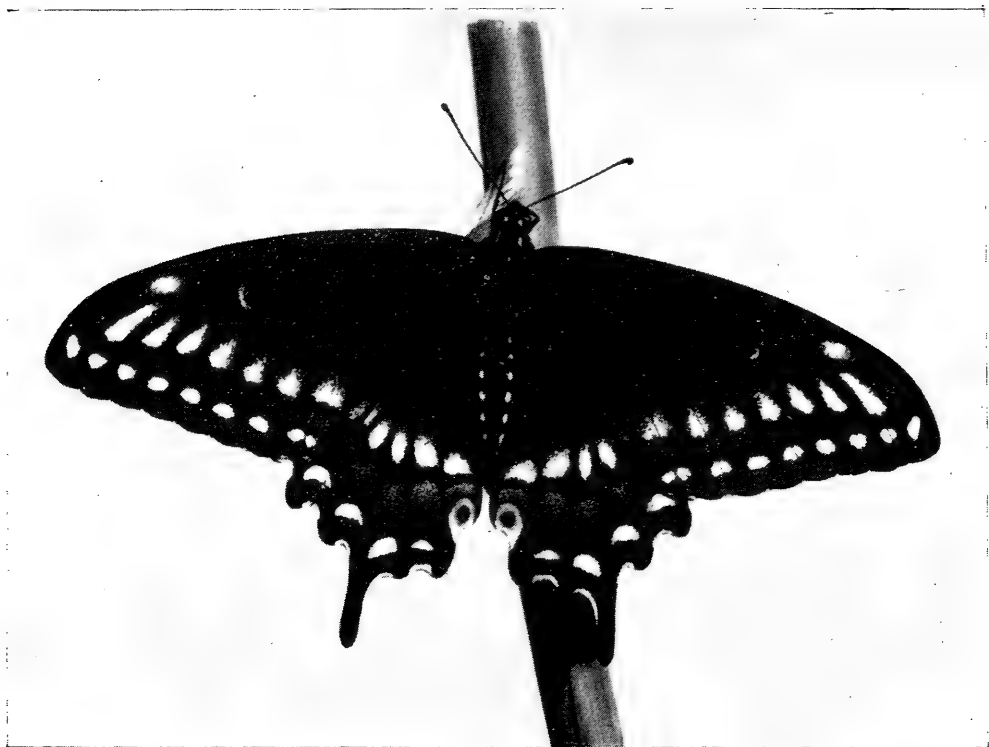


Fig. 7. ♀ "Bras".
Sexual dimorphism intermediate between *breviceauda* and *polyxenes*.

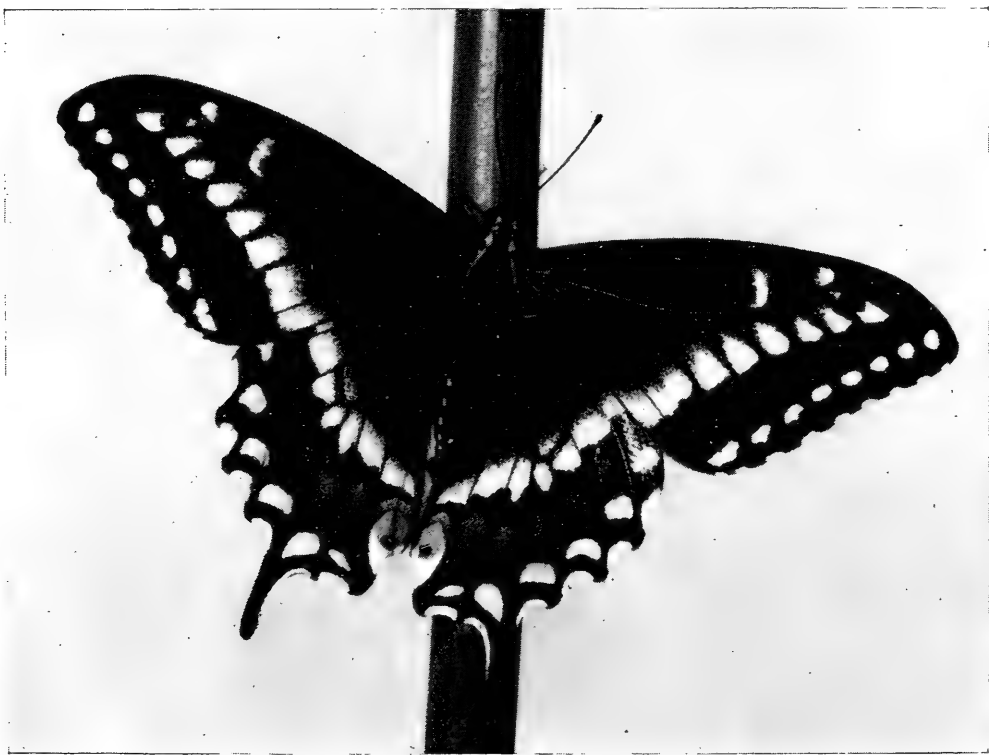


Fig. 8. ♂ "Brevimach".
Note resemblance to Hybrid "O".



Fig. 9. ♂ *P. zelicaon*.

Note general similarity to *machaon* but heavier black markings and central anal pupil.

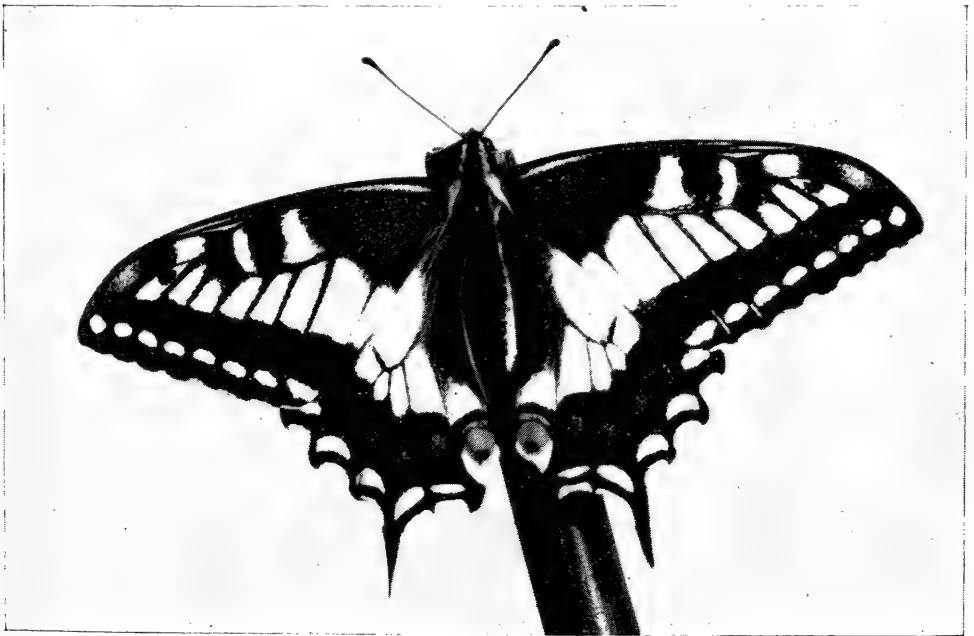


Fig. 10. ♀ "Zelimach".

Note hybrid-like type of anal spot.

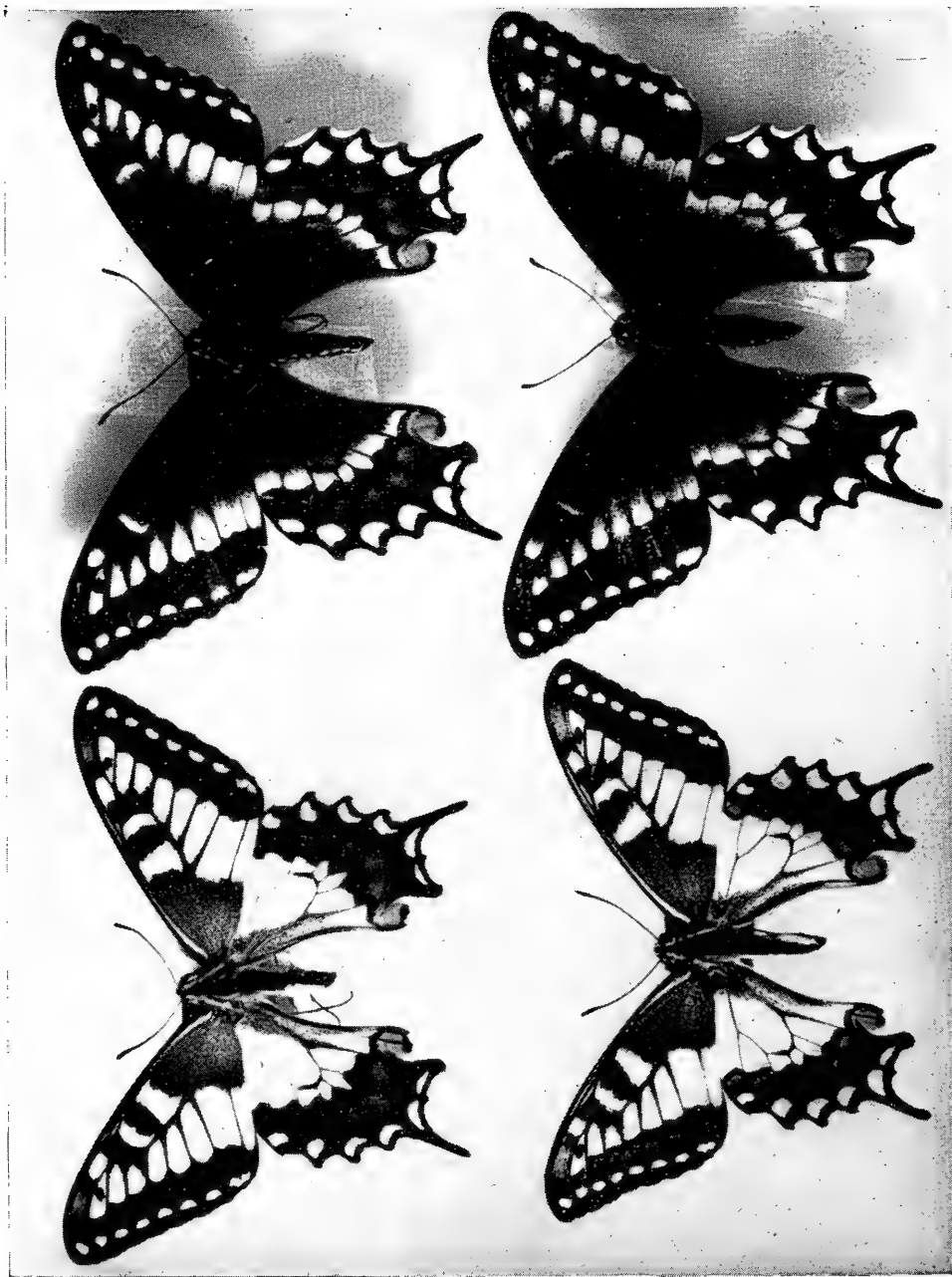


Fig 11. Offspring of ♀ *machaon* × ♂ "*brevimach*", showing segregation in respect of ground colour.

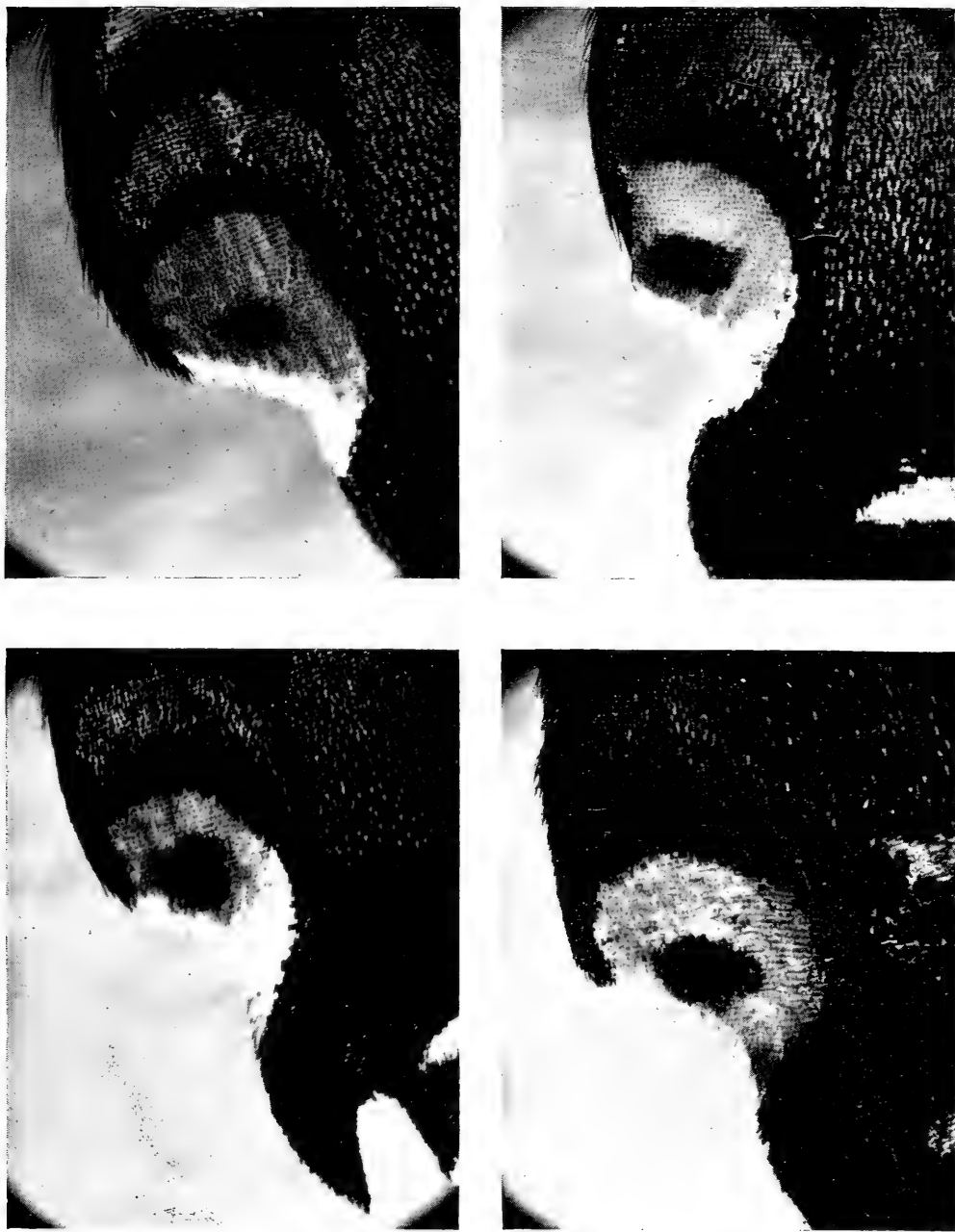


Fig. 12.

Top Left : Butterfly No. 1.

Top Right : Butterfly No. 2.

Bottom Left : Butterfly No. 3.

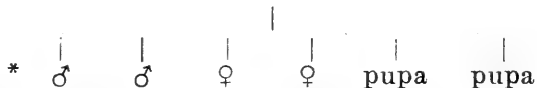
Bottom Right : Butterfly No. 4.



Fig 13 Map showing distribution in North America of *Papilio zelicaon*, *P. breviceuda*, *P. polyxenes* and *P. machaon*.

a *The Back Cross to Polyxenes.*

♂ "bras" × ♀ *polyxenes*



**Description*.—The four butterflies that have emerged strongly resemble *polyxenes* in both sexes and on the upper side are identical: on the under side the spotband is hybrid-like in two, *polyxenes*-like in one and in one we could not be certain. The tails are all long. Sexual dimorphism is present and well-marked. The larval spots in the last instar are yellow.

*Length of life cycle at 70° F.:—*42 days.

Fertility.—A brother and sister mating was easily obtained and the female laid about fifty eggs. About twenty-five hatched and from these we now have eight pupae (2.8.53).

b. *The Back Cross to Brevicauda:—*

♂ "bras" × ♀ *brevicauda*



**Description:*—The butterflies obtained are small like *brevicauda* and have wide orange spotbands. The tails, however, are long. Sexual dimorphism is absent. The larval spots in the last instar are yellow.

*Length of life cycle at 70° F.:—*41 days.

Fertility.—Unknown. Interval between emergences precluded inter-hybrid matings, and no suitable insects were available for further back crosses.

V. *P. polyxenes* ♀ × *P. brevicauda* ♂. (Called "recip. bras").

Description.— Males identical with “bras”. Female not obtained. Sexual dimorphism unknown. The larval spots in the last instar are yellow.

Number of times hybrid obtained:—Once.

Numbers and sex ratio:—

	♂♂	♀♀	
3	3	0	one pupa still to come out 4.8.53.

Length of life cycle at 70° F.:—37 days.

Fertility.—*Inter se*: not known. No fertile eggs obtained from mating ♀ "bras" × ♂ "recip. bras". No suitable butterflies available for back crosses.

VI. *P. zelicaon* ♀ × *P. machaon* ♂. (Called "zelimach").

Description.—The upper side is identical with *machaon*, except for the spot, which is "hybrid-like". The ochreous yellow background of *zelicaon* has been replaced by the yellow of *machaon*. On the underside the butterfly is intermediate, having the wider black veins of *zelicaon*, and the yellow being more ochreous than in *machaon*. In size the butterfly resembles *machaon* rather than

zelicaon. Sexual dimorphism is absent. The larval spots in the last instar are orange.

Number of times hybrid obtained:—Two: (all second brood died of virus disease).

Numbers and sex ratio:—

	♂ ♂	♀ ♀	
9 ("zelimach" 1)	6	3	(2 ♀ ♀ came out first).

Length of life cycle at 70° F.:—32 days.

Fertility:—No fertile *inter se* matings obtained. Back crosses of male hybrids to *machaon* female and female hybrids to male *machaon* were infertile. Back cross of female "zelimach" to male *machaon* was infertile.

VII. *P. machaon* ♀ × *P. zelicaon* ♂. (Called "recip. zelimach").

Description:—Males identical with "zelimach". Females not yet emerged (4.8.53). Sexual dimorphism unknown. The larval spots in the last instar were orange.

Number of times hybrid obtained:—One; failed eight times. Cross appears less fertile than "zelimach".

Numbers and sex ratio:—

	♂ ♂	♀ ♀	
3	3 (one deformed)	0	4 pupae remain (9.8.53).

Length of life cycle at 70° F.:—37 days.

Fertility:—Three back crosses obtained with *machaon* ♀ ♀: one of these produced ten eggs, five fertile. These are now half grown larvae (9.8.53). Other back crosses infertile.

VIII. *P. polyxenes* ♀ × *P. zelicaon* ♂. (Called "asterizel").

Description:—On the upper side the male hybrid exactly resembles *polyxenes*, the orange-yellow background having been replaced by black. On the underside of the butterflies there is some light yellow on the inner spotband of the hindwing and there is a faint yellow smudge on the apex of the forewing in one of the butterflies; in the other it is absent; otherwise the resemblance to *polyxenes* is complete. Sexual dimorphism not known. Larval spots in last instar not noted.

Number of times hybrid obtained:—Once. Four infertile hand-pairings.

Numbers and sex ratio:—

	♂ ♂	♀ ♀
2	2	0

Length of life cycle at 70° F.:—42 days.

Fertility:—Not known.

DISCUSSION.

Genetics.

a. The ground colour.

The results of the back cross of "brevimach" to *machaon* suggest that the difference of the ground colour is due to a single gene, the butter-

flies segregating clearly as yellow (*machaon*-like) or black (hybrid-like). It is possible, however, that the segregation is only apparent, the parent-like butterflies having emerged before the intermediate forms. If the remaining insects should fail to come out the segregation could be due to gene complexes producing intermediate degrees of blackening, giving rise to less viable butterflies. The same could be true if there had been marked infertility, but only two eggs out of twenty-five failed to hatch. A more definite answer can be given when the remaining pupae have emerged. If the difference is due to a single gene, as seems likely*, it will still be necessary to find out if the same gene is responsible for the black in *polyxenes* as in *brevicauda*.

The back crosses of the "O" and "R" hybrids to *machaon* and *polyxenes* do not in themselves give much information about the inheritance of black but they do not disprove that it is due to a single gene. A female "R" hybrid when mated to a male *machaon* gave one *machaon*-like female with a hybrid spot and its sister mated to a *polyxenes* gave four rather variable female insects all hybrid-like or *polyxenes*-like. One of these which was *polyxenes*-like (black legs, no yellow smudge and orange lunules—and therefore on a one-gene hypothesis homozygous) when mated to a *machaon* ♂ has given eleven butterflies all like the hybrids. More variation might be expected if black were multifactorially controlled but there are still two pupae to emerge which may be intermediate.

It appears that the black body with yellow spots, the presence or absence of an apical smudge as well as the amount of yellow on the legs is controlled by the factor (or factors) controlling the main distribution of black.

b. The anal marking.

The other striking difference between *polyxenes* (or *brevicauda*) and *machaon* is in the black marking of the eye spot on the anal angle. The segregation occurring in the back-cross between the female *machaon* and a "brevimach" hybrid shows quite clearly that the form of this marking is inherited independently of the black ground colour. The variability in the size, shape and position of the spot suggests that several genes are involved in determining this character. The back-cross of a female "R" hybrid to a male *polyxenes* strengthens this hypothesis (see photograph of spots). However, more data are required before it is certain if one of these genes has a greater effect than the others, causing segregation but with some variability in the character, or whether there is no such segregation.

c. Fertility.

So far no fertile eggs have been obtained from any F.1 matings but a number of back crosses have proved partially fertile. Thus, an "R" ♀ × *polyxenes* ♂ produced four fertile eggs out of twenty. Two of the resulting butterflies which had some hybrid characters (see table page) were infertile with *machaon* and one was not tested. The remaining butterfly (No. 4) had a central eye spot on the anal angle, no yellow

*Since writing this paper evidence has accumulated which suggests that the same segregation in respect of ground colour occurs in the offspring of "O" and "R" hybrids when back-crossed to *machaon*.

smudge, black legs and orange lunules, as well as yellow spots in the larva; this suggested that its gene complex was very like *polyxenes*, anyhow with respect to the genes controlling visible characters, so that fertility with *machaon* nearly as great as in the "O" hybrids was hoped for and in fact obtained.

In a back cross between an "R" hybrid ♀ and a *P. machaon* ♂ six eggs were laid, only one of which was fertile. The resulting female when mated to *machaon* produced ten eggs, seven of which started to develop but only one hatched. The ♀ butterfly from this egg when back crossed to a ♂ *machaon* produced twenty-five eggs most of which hatched. These interesting matings show that the fertility is independent of the black and there seems to have been a steady increase in the viability of the individuals with repeated back crosses, suggesting that several genes are involved in the infertility and that it has been improved either by selection or by making the gene complex more and more like *machaon* by repeated back crosses. The matings between *machaon* and *brevicauda* support the multifactorial hypothesis of viability. The F₁ matings proved infertile although the back cross was quite fertile. However, after one back cross the brother-sister mating was obtained which produced four eggs, two of which hatched even though one of the parents was black. This same black individual when mated to *P. machaon* proved quite fertile again suggesting that there has been an improvement in viability as well as that it is independent of black. The F₁ of the hybrid between *P. brevicauda* ♀ and *P. polyxenes* ♂ produced no fertile eggs, but the back cross to a *P. polyxenes* ♂ was fertile. The resulting offspring gave a fertile brother-sister mating, again suggesting an increase in fertility with back crossing.

d. Colour of larval spots.

The information on the genetics of this character is rather scanty. Since the colour of the hybrid larva is like that of *machaon* and not intermediate it seems possible that a single gene is involved. If this be the case the only back cross which throws light on the point is that of the "R" hybrid ♀ to the *P. polyxenes* ♂. Here the larva of the ♀ was heterozygous for the gene producing orange spots whereas that of the male was homozygous for yellow. This gave a clear segregation of two yellow and two orange spotted larvae. This supports the one-gene hypothesis but does not prove it, both because of the small numbers involved and the fact that there was considerable infertility, so that intermediates might be less viable. All the other back crosses have been either between two individuals respectively heterozygous and homozygous for the gene producing orange spots ("R" × *machaon* and "*brevimach*" × *machaon*) or between individuals homozygous for yellow (♀ *polyxenes* × ♂ "*bras*" and ♀ *brevicauda* × ♂ "*bras*") and therefore give no information on the genetics.

e. Sexual dimorphism.

The inheritance of this character is also of interest but the data are very scanty. The most informative matings so far obtained are between *P. brevicauda* ♀ and *P. polyxenes* ♂ where the hybrids show an intermediate degree of sexual dimorphism. The only female from a back cross of a "*bras*" hybrid to *brevicauda* was not sexually dimorphic but

a number more would have to be produced to see if sexual dimorphism was segregating or not. The matings of both *polyxenes* and *brevicauda* with *machaon* also gave some information. The F.1 from a mating between *polyxenes* and *machaon* has marked sexual dimorphism whereas that between *brevicauda* and *machaon* has none. Unfortunately none of the other matings have yet given any information on this problem so that the question is still open.

Systematics.

It is generally agreed that the members of the *machaon* complex of North America are closely related—they are in fact listed as subspecies of *machaon* by the British Museum. Their early stages and larval food-plants are all very similar and the genitalia of *machaon* and *polyxenes* are not significantly different (Knudsen, 1953, personal communication). The technique of hand-mating enabled us to start investigating these inter-relationships genetically. Using this method some useful experimental data have been accumulated in a short space of time. Much remains to be done but the evidence so far indicates that the F.1 hybrids are infertile *inter se*. It is clear from the information so far obtained on fertility that the forms are genetically fairly distinct and must be considered as at least extreme subspecies. However, for the moment it seems better to call them subspecies rather than good species, as some of the back crosses between the hybrids and parent forms are fertile. It seems reasonable to suppose that back crosses such as we have obtained may occur in nature where the insects fly together, since Floersheim (1910) noted a spontaneous mating between *polyxenes* and *machaon* in his greenhouse. Our original hybrid closely resembles a western Canadian form, *P. nitra*. This is a rare butterfly which occurs in the region where *polyxenes* and the Hudsonian *machaon* overlap. From the taxonomic point of view it is important to find out if *nitra* is a hybrid. If it is then its frequency compared with that of the two parent forms would indicate the amount of genetic interchange that does take place and so help to determine the systematic position of the two parent forms.

We are not on much firmer ground with *brevicauda* \times *polyxenes*. Ferguson (1953, personal communication) has seen these two species flying together and states that there seemed to be no evidence of interbreeding. However, in the light of our experiments this would be difficult to assess, since the hybrid would certainly be taken for *polyxenes* unless it were noticed that some *polyxenes*-like females were not sexually dimorphic.

It seems reasonable to consider the relationships of the butterflies from the point of view of fertility of the back crosses which were obtained. If this can be shown to be due to many genes, and the experimental data suggest that this is so, then the fertility will give a general guide to the degree of genetic difference between the forms not already indicated by morphological differences. It is too early to come to any definite conclusion but so far it appears that *zelicaon* hybrids may be less fertile when back crossed than other hybrids. This would indicate if it were proved that this butterfly had progressed further towards becoming a distinct species than the other forms. It is possible that the natural barrier of the Rockies has isolated *zelicaon* for a long period of

time, during which it has split up into many allied forms—*bairdii*, *indra*, *oregonii*, etc.—which we have not yet bred.

The present work, although only just begun, does show that the systematics of this group can only be understood adequately if morphological, genetic and ecological investigations are undertaken and the results combined to give a proper picture of the relationships between the forms. Moreover such a survey may in time throw light on the evolution of the group.

We wish to thank Colonel Cator for permission to visit certain areas of the Norfolk Broads to observe the Swallowtails in their natural haunts.

We are very grateful to Mr. Douglas C. Ferguson of the Nova Scotia Museum of Science for information about the distribution of *brevicauda* and for sending us pupae of this butterfly.

We are also indebted to Dr. Cyril F. dos Passos for giving us information about the general distribution of the North American forms and for help in the nomenclature.

We wish to thank Mr. George B. Reichart and Mr. Theo. W. Hower, both of California, for kindly sending us pupae of *zelicaon*.

We wish to thank Mr. Wilfred Lee of the Central Photographic Department of the University of Liverpool, for taking the photographs.

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REFERENCES.

- Clarke, C. A. 1952. Hand Pairing of *Papilio machaon* in February. *Ent. Record*, **64**: 98.
- Clarke, C. A., & Knudsen, J. P. 1953. A Hybrid Swallowtail. *Ent. Record*, **65**: 76.
- Clarke, C. A. 1953. A Hybrid Swallowtail. *Ent. Record*, **65**: 118.
- Clarke, C. A. 1952. *Proc. R. ent. Soc. Lond.*, **17**: 55.
- Clarke, C. A. 1953. *Proc. R. ent. Soc. Lond.*, **18**: 11.
- Clarke, C. A. 1953. *Proc. R. ent. Soc. Lond.*, **18**: 31.
- Floersheim, Cecil. 1910. *Ent. Record.*, **22**: 200.
- Floersheim, Cecil. 1915. *Entomologist*, **48**: 225, 253 and 275.
- Klots, Alexander B. 1951. *Field Guide to the Butterflies of North America, East of the Great Plains*. Houghton Mifflin Company, Boston.

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Dysstroma truncata Hufnagel ssp. *concinata* Stephens

By E. A. COCKAYNE, D.M., F.R.C.P.

O. H. Wild took a considerable number of *concinata* on rock faces on South Uist and had these in front of him when he described them and figured one.* He says "Colonel C. Donovan, to whom I have submitted the South Uist specimens, tells me they are similar to examples he has taken in the hilly districts of S.W. Cork and Kerry in Ireland. These lack the russet colouring of the Arran species. He considers these examples from Ireland and South Uist to be worthy of subspecific rank and intends to call this subspecies *Cidaria concinata oressigena* (Mountain bred)".

Wild did not realize that his brief description with a figure constituted publication and made him the author of the name. He depended on Col. Donovan's statement that the S. Uist and Irish specimens were similar, but in my opinion they are very different and the name *oressigena* applies only to the S. Uist form, since the figure and description are taken from it and he had no Irish specimens before him.

Mr. Siviter Smith's discovery that *oressigena* is a valid name has made me look carefully at the series of *concinata* and *truncata* in the Rothschild-Cockayne-Kettlewell collection. There are 105 *concinata* from Arran selected to show the range of variation as completely as possible. Some Arran examples are very rufous, others have no rufous markings at all, and every gradation between them occurs; some have the black areas increased at the expense of both white and rufous, and the row of white subterminal dots on the hindwing is so suffused with dark grey that it is very inconspicuous. One is a melanic aberration and another corresponds to ab. *angustifasciata* Groth, a very beautiful form with a very large area of pale rufous both inside and outside the narrow median band. In spite of the variation they have a characteristic facies.

Our Hebridean series contains 4 from S. Uist, in general appearance very similar to Arran specimens, and though Wild says his S. Uist specimens lack the russet colouring of the Arran ones his coloured figure shows one with two distinct rufous bands like most Arran ones. The 31 from Lewis all have a mottled appearance, some with well developed rufous markings others without any, but they are not so homogeneous in size or appearance as Arran *concinata*, and I do not feel sure that they are a random sample and really represent the Lewis form.

The 14 from Tarbert on the mainland of Kintyre were taken on rocks on high ground and are single brooded. They are very like the commonest Arran form. Four, labelled Kintyre, are very prettily variegated and two have extensive pale rufous markings. I have seen no others quite like them.

There are 30 specimens from Orkney which I will describe later.

From the Highlands of Scotland (Perthshire, W. Aberdeenshire, Inverness-shire, Ross-shire, and Sutherland) where *truncata* is single

*" *Dysstroma concinata* Stephens ssp. *oressigena* Wild." *The Scottish Naturalist*, 1931.

brooded there are 50 examples selected because they have in some respect a resemblance to Arran *concinata*, but even those most clearly marked with black, white, and rufous on the forewing have a different facies and as a rule have ampler wings. In some the hindwing is dark with the row of subterminal spots on the upper and the thick dark transverse line on the under side characteristic of all but the darkest Arran *concinata*. Some have a dark median area dusted more or less with white scales and bordered by a thin whitish line and outside it a narrow rufous band. These are ab. *perfuscata* Haworth similar to the one figured by Hoffmeyer in *De Danske Maalere*, Pl. 6, fig. 17, but with the whitish line outside the median area narrower. With these are a number of large bright ab. *russata* Hbn. with a clear white median area, some with and some without a rufous band outside it, and there are a few *truncata* Hufn. with grey median area. Very rarely a specimen of the *rufescens* group with rufous median area is seen. They differ from English specimens in their more intense colouring. Their larvae are green with a red lateral stripe like English ones.

The Irish examples consist of 7 from Achil Island off the coast of Mayo, and 51 from the mountains of Kerry. In addition there are 83 in the Donovan collection, 8 with *concinata* on the label and the rest with a comprehensive label "*Cidaria concinnata* Steph. ssp. *oressigena mihi*". They may have been labelled before Wild published his paper, but they prove that he intended to use the name himself for the Irish mountain form. Of the 83 about a dozen have a white median area, one with no black markings in it and none with as much black as Arran *concinata*, and some have no rufous markings. There are one or two with a grey median area, and a few are rather dark *perfuscata*, most of them with the black median area more or less dusted with white scales. The majority are much blackened and the rufous band is entirely or almost entirely obscured by black scales. They are very unlike dark *concinata* from Arran. There are no examples of the *rufescens* group.

From a wild female captured by Dr. Kettlewell I bred 41, three or four with a white median area and a rufous band, the rest dark *perfuscata* exactly like some I bred from Rannoch. A few belonged to an F2 generation, of which both parents were dark and the offspring were still darker with little trace of white dusting; all had dark hindwings with distinct pale subterminal dots. They were nearly as dark as Hoffmeyer's fig. 18. The bred specimens were larger and had broader wings than Donovan's wild ones, a difference I attribute to a more plentiful supply of nutritious food.

The few from Achil Island taken by Captain R. S. Gwatkin-Williams and Mr. W. G. Sheldon are large, clearly marked with black, white, and rufous, and have a conspicuous row of whitish subterminal spots on the dark hindwings, and the transverse line on the under side is dark and thick. Their facies, however, differs from that of any Arran *concinata*. According to Sheldon their larvae were pale green with no red lateral stripe. Those I bred from Kerry were also pale green with no red lateral stripe or only a very narrow broken one, whereas the larvae of *concinata* from Arran has light and dark green longitudinal stripes and a broad reddish purple or maroon lateral stripe.

Those from Orkney are small and the majority are much darker than most Arran *concinata* but four of the lightest match the S. Uist

examples and some of the dark ones are like the darkest from Arran. The two darkest are brownish black, even darker than the melanic specimen from Arran, with mere traces of white on the forewing but with dark rufous bands visible, and a uniform brownish black hindwing. Some of the dark ones are unlike any form I have seen from elsewhere. They have less white on the forewing than any of the Arran specimens and no rufous is visible; the hindwing is almost uniformly dark and the row of white spots and the chequering of the fringes are absent. Taken as a whole the Orkney specimens have a different facies from any others. I think they belong to a distinct subspecies, but hesitate to name it on so small a number.

To sum up my conclusions, I think *concinata* Stephens is a subspecies of *truncata* and not a distinct species and consider that it inhabits the high ground on Arran, the neighbouring mainland, and South Uist in the Outer Hebrides. I do not think the Lewis specimens are worth separating, though they are less uniform in size and in the appearance of the hindwing.

Oressigena Wild is a synonym of *concinata* Stephens. Since *concinata* is a subspecies of *truncata*, ab. *angustifasciata* Groth is available and there is no need to name this form in *concinata*.

In Orkney there is a peculiar race which deserves a subspecific name.

Specimens from the Highlands of Scotland and the mountains of southern Ireland are on the whole very similar and are brighter and more boldly marked than most English ones, but cannot always be distinguished from them. In our Irish series there is a higher percentage of blackish specimens. The use of the name *concinata* for either race is incorrect and neither has been named.

Observations on Rearing *Amathes depuncta* Linn.

By D. A. B. MACNICOL, M.B., Ch.B.

On 9th September 1952 I took a female *Amathes depuncta* L. at Kincaig, Inverness-shire, a very late date for this moth and about four weeks later than the average. The moth was kept alive and fed with sugar solution, and between 12th and 14th September it laid 84 eggs. By 29th September the eggs turned dark in colour and on 3rd October they all hatched except 4 that proved infertile.

In the meantime Dr. Cockayne had heard that I was going to try to breed the species, and he wrote and described the difficulties he and other people had encountered in unsuccessful attempts, and suggested that the larvae hatched in autumn and hibernated without feeding, probably entering hollow stems. He had found that the newly hatched larvae go into clumps of three to six when kept in a glass-topped box and lose their mobility, and very soon die without eating any of the foodplants offered.

I had quickly planted two flowerpots with small plants of primrose and white dead-nettle and scattered the surface of the soil with dry hollow stems of various lengths and thicknesses, and I put half the newly hatched larvae immediately into one of these. The other half I tried with all the likely foodplants in a glass-topped box for three days. At the end of that time no sign of feeding could be seen and the larvae had all gone into clumps of 3 to 6 and were very sluggish, so

they were transferred to the second pot. Both pots were covered with muslin and kept outside all the winter.

On 12th March 1953 a few small holes were noted in the primrose leaves in both pots and some very small larvae were seen feeding in the curled young leaves. These were left in the flowerpots till 25th April when a careful search produced 15 in all—13 from the first pot but only 2 from the second.

Unfortunately the number of instars cannot be stated with certainty, but four were seen if one assumes that it was the second in March, after hibernation, and the final instar was reached about 6th May, the last two having very much the same markings.

I sent Dr. Cockayne six larvae in their final instar, and of the nine which I kept, all pupated in earth between 20th and 27th May, and 8 moths emerged between 16th and 19th July and one on 9th August.

Up till the end of the last but one instar the larvae showed a strong preference for primrose and white dead-nettle and, when I could get it, *Vaccinium myrtillus* flowers and young leaves; but in the final instar they accepted readily all the usual "low plants" such as plantain and knotgrass, and also willow and apple, and grew very rapidly.

It is quite evident that the larvae do hatch in autumn, usually some time in September, and hibernate clustered together in small groups in hollow stems without feeding until about March. Barrett states that the larva has been swept from low plants as early as January, but I do not think this would be the case in the localities where it is most common in Inverness-shire and Moray. In several places in these counties where I have found the moth fairly common at sugar there is certainly no primrose or dead-nettle, and the only likely foodplant would be *Vaccinium myrtillus*, which would not produce leaves and flowers till late April or early May, and even later in some years. I offered the larvae the evergreen *Vaccinium vitis-idea* in early April, but they would not eat it.

The following is a description of the larva in its final instar, 6th May 1953:—

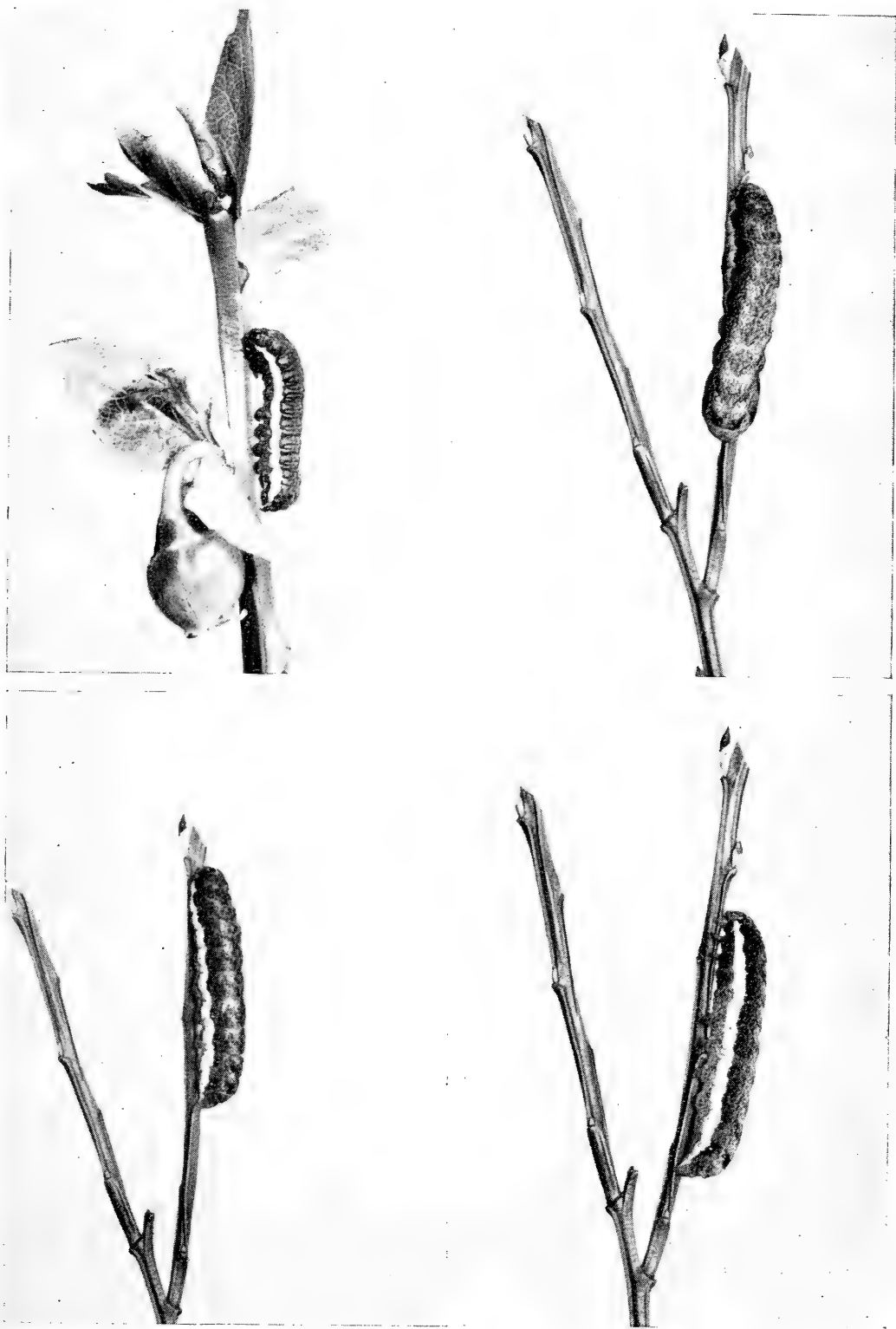
Length just under 3 centimetres. Medio-dorsal line whitish, faint, rather broken, but clear on plate on segment one. Dorsum sooty brown, formed by a varying amount of light grey and blackish mottling, and with a rather faint formation of dark, oblique, stripes, clearest on segment 11, making a blackish wedge; on segment 10 making a faint wedge.

A broad, blackish, stripe in subdorsal area, with the spiracles near its lower margin. Spiracles pinkish-white, each surrounded by a small, oval, pitch black area.

Subspiracular stripe broad, clear-sulphur-yellow. Ventral area below this abruptly greyish-ochreous, with a little black mottling. Head narrower than 1st segment, glossy ochreous, with a blackish, tapering, mark on each side, broad above; some dark reticulation at sides. Plate on segment one about the same colour as the rest of the dorsum, but light grey on anterior one-third, and with 3 clear, light, lines.

Thoracic legs and claspers the same colour as underside.

[From 9th to 18th August 1927 I was at Forres and took from one to five *Amathes depuncta* on ragwort nearly every night. Most were females that had laid their eggs, but eggs in masses on and behind



THE LARVA OF *AMATHES DEPUNCTA* LINN.

Above: *Penultimate instar* $\times 2$.

Below: *Final instar* $\times 1$.

Above: *Final instar* $\times 1$.

Below: *Final instar* $\times 1$.

muslin were laid by one female on 10th August and two others laid eggs on 11th August. Fertile eggs had a red dot at the micropyle and thin red ring round. The larvae hatched on 23rd and 24th August and were pale ochreous, rather stout, with small black tubercles, and a very black head and prothoracic plate. After eating their eggshells they rested in heaps and ate nothing, and however often they were scattered with a soft brush they found one another and formed one or two heaps again. Those I tried to force died, but I still had 42 on 3rd October and put them on to primrose plants in two flowerpots and never saw them again.

Years later I found a note by J. E. Gardner entitled "Habits of Young Larvae of *Noctua depuncta*" (*Ent. Rec.*, 1906, **18**, 7/9) giving a very good account of their gregarious habit and refusal to feed. This was what made me think they hibernate in a hollow stem, probably the dead broken stem of an umbelliferous plant. Next time I went to Forres I failed to get a single *depuncta* and so was unable to test my hypothesis.—E. A. COCKAYNE.]

Melanism in *Tethea ocularis* Linn.

By H. C. HUGGINS, F.R.E.S.

Tethea ocularis L. has always seemed to me one of the three insects characteristic of Westcliff-on-Sea, the other two being *Catocala nupta* L. and *Sesia apiformis* Cl. All three are common on the rows of poplars with which most of the streets in the district are planted, though *ocularis* is the most difficult of the three to obtain. However, this year I installed a mercury vapour lamp trap and *ocularis* soon began to appear in some numbers and, to my surprise, in several forms. Besides the typical, three melanic forms appeared, two of which were equally common whilst of the third I saw only two, one of which was damaged and so was released.

The first is a form in which the upper wings, thorax, and abdomen are olive-brown, with the exception of the space between the two double lines which enclose the '80' mark, which is somewhat lighter. All the usual markings are present.

In the second form the whole upper wing and thorax are leaden-black, which shines with a greenish reflection when viewed transversely. The markings are all present as still darker lines.

The third and rarest form is a genuinely black insect in which all the markings are invisible from the base to the outer of the double lines, the remainder to the apex can be made out with some difficulty. In this insect even the '80' mark shows signs of suppression. Its white is more conspicuous than usual owing to the black ground, but the 8 is reduced to an X, so that the mark is XO.

I wrote to Dr. Cockayne as these moths began to arrive and he kindly informed me that melanic forms varying in blackness had appeared quite recently in Herts, Cambs. and Cheshire and that their occurrence in so many places was a remarkable phenomenon.

Mr. A. M. Morley has suggested that they may have come from Belgium, where they appear to have been known for some time, but although at first examination the idea seems probable I do not think it likely that the moth could have reached Cheshire in so short a time.

Mr. Morley informed me that *ocularis* was practically unknown at Folkestone before the war, so that it might, like *Hadena compta* Schiff., have come from abroad.

I am practically certain the melanic form has arrived here only in the last year or so. The proportion of melanics, lumping all the forms together, to that of the typical form is about one to three. I have seen a few *ocularis* almost every year since 1946 and until this year never saw a melanic one.

The melanic forms were certainly not here in 1935. In that year I decided to breed a good number of *ocularis* from several localities, so collected about a dozen from Barton Broad from aspen, ten from Hadleigh Woods, also from aspen, and nine from Westcliff from poplar. Every moth I bred from all three localities was quite typical. The larva of *ocularis* is easy enough to find at the end of July if aspen and poplars be examined about two hours after sunset, when the white, rather disagreeable-looking larva will be conspicuous in the light of a torch. It is very easy to rear if taken then in the last skin. I do not remember losing any.

Although melanic *ocularis* are very interesting I hope that they will not swamp the rather pretty typical insect, as the melanic *Biston betularia* L. have done locally.

The melanic *ocularis* has turned up in equal proportions at Hadleigh and Hockley, quite outside this town.

[R. T. Bowman took a nearly black *Tethea ocularis* at Chingford (*Entomologist*, 1919, 52: 47). I know no other record of melanic *ocularis* in this country before those of the last few years.

Derenne (*Amateur des Papillons*, 1935, 7: 285) described f. *franki* as completely black save for the two characteristic markings, the reniform and orbicular, which are vivid greenish yellow. The form was first found in 1922. At this date the typical form was the common one, but in later years it has been replaced by *franki*. At Roubaix for the last two years all have been *franki*, but at Cysoing less than 20 kilometres from Roubaix the two forms have been equal in numbers.

The description of *franki* does not agree with any of the three melanic forms described by Mr. Huggins, but the rapid way it has increased may be comparable with that of the English melanic forms.—E. A. COCKAYNE.]

Notes on the Butterflies of the North Kent Marshes in August, 1953

By D. F. OWEN.

In mid-August 1953 K. H. Hyatt and I spent three days on the North Kent marshes between Higham and All Hallows. Most of the time was spent in walking over the marshes and along the sea wall in fine weather. This area, like much of the low lying country on the east coast, was almost completely covered with sea water during the severe floods early in the year. It would be reasonable to suppose that this major ecological change would have some effect on the butterflies,

which at that time of year would be mainly in the larval or pupal state. With this in view we tried to estimate whether any species were less common, more common or similar in numbers to other localities which had not been flooded. We also formed impressions of numbers in relation to previous seasons, this, however, might be misleading as numbers of each species have fluctuated considerably during recent years.

Very few species seem to have been really badly affected by the flooding. *Pararge megera* L. was common all along the sea wall and was also seen in fair numbers on grazed land, but our impression was that it was not as numerous as on the higher ground off the marshes. *Maniola jurtina* L. was definitely much scarcer, but the situation was confused as numbers elsewhere appeared lower than usual. No *Aphantopus hyperanthus* L. were seen, but the status of this species on the marshes is uncertain (1950, *Entom.*, **83**: 119-120), and in any case by mid-August few could be seen in woods bordering the marshes. Very few *Lycaena phlaeas* L., *Coenonympha pamphilus* L. and *Pieris* spp. were seen, but it is difficult to be certain whether this was due to the floods. No *Thymelicus lineola* Ochs. were seen. This species is normally extremely common in the area and by mid-August we usually see many worn individuals on the marshes. There was also a noticeable lack of migrants, but this seems linked with a general scarcity. Summarizing, numbers of *M. jurtina* and *T. lineola* have been reduced, but for the others the position is rather uncertain.

A few notes on other species seen may be of interest. Six *Eumenis semele* Hub. were seen on the sea wall at Higham. This species had previously been recorded in the area in 1948 when one was seen on the marshes at Cliffe. In 1949 a colony was found at Higham, though none have been seen since until 1953. The habitat is unsuitable but the new records suggest that a colony is established somewhere. *Maniola tithonus* L. was widespread over the whole area, being especially numerous near the sea wall. Also many were seen in open agricultural country between the marshes and the woods at Northward Hill. This marshland habitat of *M. tithonus* seems unusual for a butterfly which is normally associated with woods and hedges (1950, *Entom.*, **83**: 119-120). The butterflies appeared specially attracted to the flowers of *Pulicaria dysenterica* and *Malva sylvestris*, both of which are abundant on the marshes. *Polyommatus icarus* Rott. was extremely common on the sea wall between Cliffe and All Hallows. Dozens could be seen together and in the evenings many rested in the long grass. Smaller numbers of *Aricia agestis* Schiff. were seen. Our impression was that both these species were more common than in previous years. One day-flying moth, *Aspitates ochrearia* Ross., seemed as common as usual throughout the area.

One of the most striking features of the butterflies on the North Kent marshes was the concentration of both individuals and species along the sea walls. Here, unlike the open fields where cattle graze, the grass grows long and there are many flowers which are attractive to certain species. Also butterflies take advantage of the shelter offered by the sea walls from the strong winds. The effect of wind might in addition influence numbers as it seems likely that some butterflies are blown out to the marshes from other habitats.

Does *Charaxes jasius* Linn. occur in Turkey?

By MALCOLM BURR, D.Sc., F.R.E.S.

It has been asserted that *Charaxes jasius* L. has been found on the island of Prinkipo (Büyük Ada) in the Sea of Marmara, near Istanbul. This has become a legend, but I have never known anyone who has seen the species there. I traced it down to the paper on the Lepidoptera of the neighbourhood of Istanbul by the late Philip Graves, who had worked this district for some years and knew the lepidopterous fauna of the region better than anyone except Dr. de Lattin. In his paper (*Entomologist*, 1925, **58**: 294) he wrote of this species that "Dr. Buresch took a specimen . . . on Prinkipo Island in September 1918, which is in the Royal Entomological Museum at Sofia". Graves added that he had never seen it there, but had never looked for it. In his articles on collecting in the district in *Ent. Rec.*, 1911, **23**: 315, and 1912, **24**: 10, Graves does not mention it.

My interest in the question was aroused about ten years ago when Sir Leigh Ashton told me that when he had gone on an excursion to the island of Yasi, in the same group, he had seen a number of huge brown butterflies sunning themselves in the ruins on the old landing-stage of that island. He said they were known as the "Pasha of Two Tails" and he recognised them clearly, although not an entomologist. After all, they are unmistakable and Sir Leigh Ashton may be trusted to know them.

For several years in succession I paid visits to the island of Yasi at dates from late June to middle July in the hope of seeing this magnificent insect, but never with success. The island is now out of bounds. I do not remember seeing *Arbutus* growing there, which is its food-plant, but on Prinkipo, the greater part of which is built over as it is a fashionable resort, there is abundance of *Arbutus andrachne* on a patch of the original maquis on the south-east coast. I have looked for it there too, but without success.

Some months ago I met one of our diplomatic staff from Sofia and asked him if he would kindly have a look in the Museum and let me know if there were any specimens of the butterfly there from Prinkipo. As the late King Ferdinand was a keen naturalist, who collected both birds and butterflies, I think it likely that there may be specimens in the Museum, which presumably contains his collections. Recently I had a letter from my friend at court with the remarkable news that the Museum is open only on Sunday evenings and that there are no *Charaxes* from Prinkipo there but that there are two males and a female of *C. jasius* taken at Ombla, near Dubrovnik in Dalmatia in the 'twenties.

In April I wrote in Russian to the Director of the Zoological Museum in Sofia asking him to be good enough to inform me whether there were any specimens of *C. jasius* from Prinkipo in the collection, and at the end of June I was surprised and pleased to get a letter in German from Dr. Buresch himself, telling me that he knows of no record of this species from Prinkipo although he had been there to look for it in October 1909 and September 1935, but that once Philip Graves had told him in conversation that he had not been able to find *C. jasius* on the island, which is strange in view of Graves's statement quoted above.

There must have been a misunderstanding between them, perhaps through a difficulty of language.

Dr. Buresch continues that in October 1909 he himself took *C. jasius* in Southern Thrace, east of Kavala, in some numbers and that there is plenty of *Arbutus* there, both *unedo* and *andrachne*. Also that he had taken *C. jasius* in some numbers at Ombla, near Dubrovnik, in Dalmatia, in September 1917, so those must be the specimens in the Sofia Museum to-day. In my young days I had several times visited Ombla, a remarkable spot, but had never had the luck to see this splendid insect. As Buresch reports it in September and October I must always have been too early.

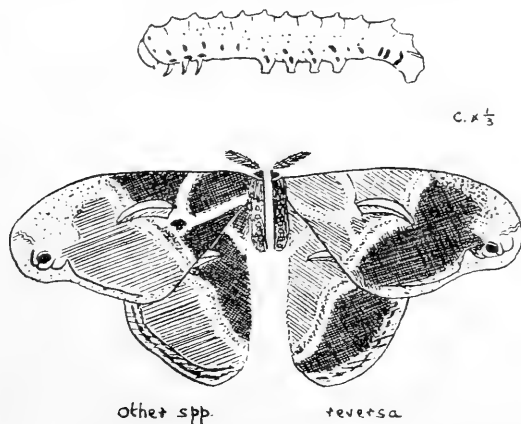
As to the Turkish title of "Pasha with Two Tails", this is both appropriate and interesting. I have been told by someone—I cannot remember by whom—that it is actually so-called by the Turks. In ancient times there were three degrees of the rank of pasha, indicated by one, two and three horses' tails respectively as emblems on their standards. I have not yet run this down, but hope to do so.

So this magnificent butterfly is not yet authentically on the Turkish list; but as the foodplant is abundant enough over wide stretches, especially along the south coast of Anatolia, most probably it only requires looking for at the right season.

A New Hybrid Race of the Genus *Philosamia*

By W. J. B. CROTCH.

The Silkmoth *Philosamia cynthia* Drury (Saturniidae) has many subspecific forms in various parts of the world, notably *P. cynthia canningi* Hutton in South Asia; *P. cynthia walkeri* Felder in Southern Europe; *P. cynthia advena* Packard in North America; *P. cynthia obscura* Butler in North India; and *P. cynthia ricini* Boisduval, a domesticated Asian form, probably debased from *obscura*. They have in general been raised to specific status*, because, although the basic



(and very distinctive) wing pattern remains pretty constant, the colouration of the moth is extremely variable when introduced into new regions. Its ground colour varies from pale gamboge to olive green in

*I deprecate this and regard the different forms as races. All the evidence points to their being as inter-miscible as *Homo sapiens*.

one direction, and through warm browns to Vandyke brown and even sepia in the other; while wing-span varies from 8 cm. to 14 cm. In all forms the pattern of the fore and hind wings is disrupted by a broad transverse double bar of white, often bordered by vivid heliotrope or pink. Among the many hundreds of wild specimens available for reference in the British Museum (Natural History) collections at Tring and Kensington, the ground colour nearer the body is of darker tone (whatever the colour) than that beyond the bar towards the margins of the wings.

Mr. M. Harrison-Gray, having supplies of both *P. canningi* (an almost ginger form) and *P. obscura* (a blackish brown form), obtained cross-pairings in both directions. From the very numerous fertile ova which resulted, I was permitted to segregate about forty larvae which were readily distinguished from their congeners by heavy lateral markings (see upper figure) which took the shape of short bars on the posterior segments, in place of the normal circular or slightly oval dots which are usual, when present at all.

Members of the Silkmoth Study Group of the Amateur Entomologists' Society have since been breeding from within this initial stock, which provided imagines which favoured the ground colour of *obscura*, but retained the pink borders to the double transverse bar that are vivid in *canningi*, but absent in *obscura*. They showed however a remarkable reversal of the colour tones referred to above (see lower figure). The outer area is distinctly darker than the inner. This characteristic has remained fixed in the third filial generation and it is proposed to give it the name *Philosamia (cynthia) reversa*.

The colouration of the type diagrammatically depicted is as follows:—linear markings white, outlined in black, except double transverse bar, which is white broadly bordered with bright rose madder. Crescents hyaline above, Indian yellow below. Apical spot indigo, in area of middle grey. Margins sepia. Outer ground colour dark Vandyke brown: inner ground colour raw umber.

In a Devon Garden

By E. BARTON WHITE.

An opportunity to plan a new garden which would be attractive to insects occurred at the end of 1936, when a bare field of one and a half acres was acquired about a mile from this village. It is on a gentle slope downwards from North to South, bordered on the North by a third-class road and steeply rising ground beyond; to the East by a bank and hedge of elm, hawthorn and bramble, and a row of Scots pines in a neighbour's field; on the West by a fence and evergreen hedge over which is another garden. On the South there is a nut hedge and bank over a deeply sunk lane, and beyond that is some cultivated flat land before reaching the marshes around the estuaries of the Taw and Torridge where they meet to flow past Appledore and Westward Ho! into the Atlantic bay. The Western and South-Western outlook is over the back of the sandhills of the "Burrows" about two miles away and across the water towards Clovelly and Hartland Point. The plot is therefore very exposed except to the North. Atlantic gales do much

damage from time to time and a cold East wind comes down a partly wooded valley about March.

The field had been used mainly for grazing sheep and the soil is a fairly heavy loam with, here and there, streaks of yellow clay some four or five feet down, discovered when excavating for a pond.

The main entrance was made on the North side near which the house was built. All that need be said about this is that french windows from the Study led on to a three-sided loggia facing South and South-West down the garden and over the estuary. An electric lamp hangs in the loggia. The garden was planned in green plasticine on a 2' 6" square board. From halfway down the East bank to the bottom a willow grove was planted, through which a path led down steps to the lane. Dotted about here are a few poplars, beeches and an oak. On the West side a wide flower border was made, backed by bushes of *wiegela*, lilac, *lobelia*, *buddleia* and hawthorn, with a few beech, ash and sycamore trees. In the border were planted michaelmas daisies, kaffir lilies, etc., in front of which annual seeds are sown, the most attractive of these to day-flying insects being the blue *Gilia*. There are also some perennial tobacco plants, night-scented lilies and stock.

The slope from the house necessitated a stone terrace, and a rockery was made along this with a lavender border. To the West side of this a red valerian bank was planted. About one sixth of the ground was allowed to grow wild, but on it some two dozen apple and fruit trees were planted. This patch contains much knapweed, scabious, red and white clover, trefoil, ragwort and some thistle. The Eastern bank is also covered naturally with ferns, ribbon grass, red and pink campion, primrose and white violet, and on the floor of the adjacent willow grove is wild hyacinth. Daffodils and narcissus have been added.

A wide strip along the South, above the lane, has been kept as a kitchen garden, bordered by a trimmed *Lonicera* hedge. The terrace contains a tank to collect roof water. This overflows under the rockery to supply a small pond, near which is a group of silver birches on a mown lawn. A channel from this overflows indirectly into a larger pond forty feet long by an average of fifteen feet, sunk well below the surface level to be out of the wind, bounded by high banks of flowering shrubs and sheltered from the West by a high *Escallonia* hedge, the flowers of which, both red and white, are very attractive to night-flying insects. Along a paved path by this pond is a larchwood pergola of honeysuckle, *Clematis montana* and climbing roses.

Several species of water-lily and other aquatic plants are in this pond. It is 4' 6" deep at one end and shelves up to a gravel bed at the shallow end which is used mainly as a bird bath. It was astonishing to find that by the second year this pond contained so many aquatic insects. The Odonata were represented by a large *Aeschna*, *Libellula depressa*, an occasional banded *Agrion* and many blue and black damselflies. The nymphs of the larger dragonflies are vicious in their attacks on small fish. Among the Coleoptera are *Dytiscus marginalis*, *Acilius sulcatus*, *Gyrinus natator* and *Notonecta glauca*. These, too, attack small fish. In spite of this, the three dozen fish introduced in 1938 have now increased to over three hundred. Their main enemy is the heron who waits for them at dawn in the shallow end and will take ten or more fish on one visit if not disturbed. By the second year, caddis flies and mayflies had also arrived.

One neighbour looked on this pond with suspicion, declaring that I was breeding mosquitoes for his benefit. Very few gnats, if any, succeed in completing their larval existence in this pond, for they are the fishes' favourite food. Between this pond and the house a mown lawn has on it two maples and a weeping willow. There are also six red-skinned filberts nearby. Several trees, mainly poplar and hawthorn soon had lichens growing on their trunks and branches.

With regard to the Lepidoptera, a list of species common to most gardens would not be of interest, Common species are only mentioned for some particular reason. Twenty-seven of the butterflies have been found here. The larvae of *P. brassicae* and *P. rapae* are known to the native gardening fraternity round here as "maskels". The spelling is mine as I doubt if the word has ever been printed. So far, I have not discovered its origin, but must make further effort. *C. croceus* comes up from the Burrows whenever there has been a migration, and in 1947 a number of the October brood were reared in this orchard. I boxed one var. *helice* with unexpanded wings, and two others that had not yet flown. *C. hyale* has paid several visits but only to fly rapidly from South to North, scorning all flowers, and has been seen to settle only twice. *A. paphia* unexpectedly visits the flower border each year, the nearest woods being half a mile away. *P. c-album* is plentiful, a rather small dark form, and this April was on damson blossom in the orchard. Var. *ichnusa* of *A. urticae* is not uncommon, and one extreme var. *nigrocaria* was taken on Buddleia bloom four years ago. *P. aegeria* was soon established in the sallow grove, and is plentiful from mid-April. It is flying now on September 14th. It wanders into the sunny parts of the garden where it assumes a much more lively flight, but seldom settling on flowers, preferring to sun itself on shining evergreen leaves. It seems a smaller and rather darker form than those from other districts. Occasionally an extra spotted dark form of *M. tithonus* occurs among many of the type. A few *A. hyperanthus* are to be met in the sallow grove each year. *L. phlaeas* varies much in numbers from year to year and even from brood to brood. One fine ab. *fasciata* has been taken. *P. icarus* soon became established in the orchard and several interesting female forms have turned up. *C. argiolus* is very plentiful. *T. quercus* and *C. rubi* have both been seen to visit the flower border singly.

There is a noticeable tendency to melanism in North Devon, for instance, in *H. conspersa*, *C. lichenaria*, *C. repandata* and *E. bistortata*. Some beautiful forms of *lichenaria* have been taken in the loggia. Apart from melanism, many species are richer and darker in colour than the average. This is seen in the males of *P. potatoia*, in *A. clavis*, *D. rubi* and many others. *E. fasciaria*, which came regularly to light in some numbers until a neighbouring larch plantation was demolished, frequently was of a dusky leaden grey colour which I have not seen elsewhere.

The Sphingidae are well represented. *L. populi*, *S. ocellata*, *S. ligustri*, *D. elpenor* and *C. livornica* (one) have all visited the loggia, and *H. convolvuli* visits the tobacco plants. *M. stellatarum* is about every year and has already been seen this April over the rockery. Other moths taken in the loggia include *A. villica*, *M. miniata*, *C. coryli*, *E. nigricans*, *H. nana*, *E. lichenea*, *H. conspersa*, *B. sphinx*, *A. praecox*,

D. templi, and *P. umbra*. I have not known *praecox* so far inland before. *D. templi* comes from the flats behind the sandhills where the cow parsley grows luxuriantly. I think the moth most frequently found on the windows is *O. hexadactyla* (*polydactyla*). This is not surprising since honeysuckle is everywhere. It is found commonly indoors where it suffers from being taken for a "clothes moth".

There is a constant patrol of bats outside the loggia. They have even come in and taken moths off the Study window. Often they hang up on the rough-cast walls to devour their prey, and they must account for an enormous number of insects judging by the wings on the floor which are duly inspected in the morning.

The China Mark, *H. nymphaealis*, has found its way to the pond but it is kept severely in check by the fish, which eat the floating larvae in their cases. I have also suspected the Yellow Wagtail of this while standing on a water-lily leaf.

Sugaring has been disappointing. I have used pieces of cork bark on stakes about three feet high. A dozen of these have been placed in what were thought likely spots in the garden. Only the very common species have appeared. I found one *A. c-nigrum* paired with *A. xanthographa* on the sugar patch. No eggs were laid.

Noting South's statement that *L. quercus* f. *callunae* is not uncommon in the Exmoor district, I have assembled with both local and Scottish females during three separate seasons within the last six years, and have examined over 270 males. Every one has been of the *callunae* form. I am a little puzzled, for the *Ilfracombe Fauna and Flora* of 1946 gives the type *L. quercus* as abundant about Braunton.

Sallow blossom has attracted the usual crowd of common insects. Among the many common larvae, *D. vinula* occurs on the weeping willow, *L. ziezac* on sallow, *N. dromedarius* on birch, *L. quercus* on hawthorn and *P. potatoaria* on ribbon grass. *H. papilionaria* has been found more than once on silver birch. Though a privet hedge is less than fifty yards away, *S. ligustri* is found most years on the dwarf or Persian lilac. *A. villica* is fairly regular on dandelion and groundsel. Bullfinches invaded this garden some five years ago and a brood of them has been reared each year. Since when there has been no blossom on the *Prunus* trees and very little on the double red hawthorn. I have watched the birds systematically stripping the twigs, suggesting that these birds are not entirely insectivorous, but largely salad eaters.

One pupa of *A. atropos* was dug up with the potatoes, but was injured at the time.

Some Auction Sales of the 'Nineties

During the decade 1890-1899 several collections of Lepidoptera came under the auctioneer's hammer in London each year. In March 1890 J. C. Stevens announced for sale by action the collection of an anonymous lepidopterist which contained "authentic specimens" of *P. daplidice*, *V. antiopa*, *L. dispar* (several), *C. semiargus*, *N. subrosea*, *C. fraxini* "and many fine varieties, including Black Sibylla". Howard Vaughan's cabinets came up for sale the following month, the first of the great sales

of the 'nineties. The specimens were "all authentic and mostly labelled, and in the finest condition", and the collection was "remarkably rich in Varieties and local forms", with "fine series" of *L. dispar*, *N. subrosea* "and many other rare and extinct species", also "valuable Hermaphrodites". The micros in this collection were sold a month later and included series of named aberrations and local forms of *P. hastiana* and *cristana*, *C. ocellus*, *myellus*, *alpinellus*, and *T. pryerella*. Prices ran high. Three aberrations of *C. croceus* fetched £10 each and a fourth ten guineas, which price was also paid for a damaged aberration of *A. aglaia*. £9 10s. was given for two aberrations of *V. io*, the same for a *V. atalanta*, and £10 for an aberration of *V. cardui*. The Lycaenids were sold at from 2 to 4 guineas a lot and an aberration of *A. caja* for 15 guineas. All the high prices were given for aberrations.

The only important sale next year was the collection of the Rev. G. H. Raynor, later to become famous for his aberrations of *A. grossulariata*. His collection included both macros and micros with "remarkable varieties" of *A. cardamines*, *Z. filipendulae* (yellow), *E. fasciaria* (green), *C. pusaria* (black), *C. clathrata* "and many others". The whole was contained in "three expensive cabinets by Standish". Towards the end of the year the Coleoptera and Lepidoptera of Ferdinand Grut, British and Foreign, also came under the hammer, together with the library of entomological books which Grut had formed.

In the spring of 1892 Stevens sold the collection of R. E. Salwey. The specimens in this collection were "in exceptionally fine condition" and included a black *M. stellatarum* as well as *H. pinastri* from Suffolk, *A. arenaria* (*viduata* Schiff.) from the New Forest and "a beautiful lot of Pterophori . . . in perfect order". Arthur Naish's collection, which came under the hammer in May, had seven *L. dispar* (of which a ♀ "in very fine condition" made £4 10s.) and "some fine pink specimens" of *N. subrosea* with "some beautiful varieties of *A. caja* and an almost unique long series of *Nemeophila plantaginis*". The 'pink' *N. subrosea* sold for 8s. to £2 10s. each. An *A. caja* with yellow abdomen and hind wings was knocked down at 8s. 6d. Whether it came from Wimbledon or Wiesbaden we should have thought it was worth more than that. Four Mazarine Blues, "perhaps extinct", made 18s. and 8 *L. caenosa*, "apparently recently extinct", £3 17s. 6d. A small sale (E. Cooper) in August contained "a small series of fine bred specimens of *P. dispar*". This autumn was to see the dispersal of one of the largest private collections of British Lepidoptera which had been formed hitherto, that of the Rev. Henry Burney, rector of Wavendon, near Fenny Stratford, Bucks.

The Burney sale began on 21st November. Burney, who had died in the previous July at the age of 79, had been rector of Wavendon since 1847. It was a living in the gift of the Hoare family (bankers) and Burney had been instituted to it, shortly after he came down from Oxford, at the age of 23. The rectory of Wavendon was worth nearly £700 a year and had 83 acres of glebe; its incumbent therefore—when one considers how far the pound went in those days—was in "comfortable circumstances". From his youth he had been an ardent lepidopterist and after middle age he began to increase his collection by buying widely from the dealers—widely but not wisely, for he showed small discrimination in his purchases. By the time of his death he had

amassed long series of exceedingly rare and extinct species (he had 31 specimens of *L. dispar*, which sold for £132 10s.); but the names of the *soi-disant* captors on some of the data labels frightened the assembled company and prices were strangely erratic. However, the 42 *C. semiargus* fetched an average of eight shillings apiece, 53 *M. arion* 2s. 6d. each. The most desirable item in this vast collection seems to have been a melanic *P. dominula*, which made £10. This sale, with its plethora of Continental specimens masquerading as British, gave rise to an amusing article in this magazine (*Ent. Rec.*, 4: 325) which well deserves re-reading to-day. After lasting for two days the Burney sale was continued in the following January.

The collection of J. R. Wellman of Clapham, London, which came under Stevens' hammer in July contained 12,000 specimens and was the fruit of forty years' assiduous collecting. Most of the specimens were bred, all were in perfect condition, and they had reliable data. But there were few rare and extinct species and very few aberrations of butterflies, so the entire collection fetched only about £200—a disappointment to its owner who had parted with it owing to ill-health. Collections formed by the Rev. J. St. John, Jenner Weir, Francis and one or two others were sold the same year but did not call for any comment in the magazines.

The J. W. Downing collection (23rd October) occupied two 40-drawer and one 17-drawer cabinets and contained *L. dispar*, *L. caenosa*, *N. subrosea*, etc., but was of no interest to the field lepidopterist since the contents of this collection had nearly all been caught in London, Downing having been "a constant frequenter of Stevens' sale rooms for several years past". A "very fine black male *Lycaena adonis*" was purchased for £3 10s., but there is no mention of any other aberrations of butterflies. Prices seem to have been good, perhaps because the specimens were adorned with authentic auctionroom data labels. "The gem of the collection," wrote T. W. Hall, "was a remarkable mottled variety of *Venilia maculata*, in which the ground colour and the colouring of the spots apparently changed places." This aberration made £4

(To be continued.)

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Diasemia ramburalis Dup. Workers with m.v. light on the South Coast, particularly in the south-west, should keep a sharp look-out for this obscure little insect, many of our recent captures having been in late October or early November. The beautiful *Margaronia unionalis* Hüb. is likely to occur at the same time but is so conspicuous that there is little likelihood of its being overlooked, whereas the miserable looking *ramburalis* might easily be passed over as a worn faded *purpuralis*, which occasionally occurs in October, probably a partial third brood. *D. ramburalis* has never been bred in this country as Mr. Howarth and others have bred *unionalis*, and the experiment should be worth trying, though an August female would be preferable for the attempt.

Peronea contaminana Hüb. may be beaten from hawthorn in October and as it varies very greatly is of interest to the collector not favourably placed for a *cristana* hunt. I always used to call *P. variegana* Schiff. "the poor man's *cristana*" because of its great range of variation, similar habits, and wide distribution; but *variegana* is finished after mid-September so the analogy is not perfect. *P. contaminana* may also be found with a lantern, sitting on hawthorn twigs after dark, and is easy to box. I have particularly noticed it when working late-flowering ivy.

Peronea ferrugana Schiff. and *P. fissurana* Pierce may now be beaten from birch and oak respectively. Although *fissurana* is sometimes said to feed on birch I have never found this to be the case. I sent many, carefully selected where the food-plant was known, or where they had been beaten from isolated trees, to the late Mr. Pierce and in every case the birch insects were *ferrugana* and the oak ones *fissurana*.

Peronea lorquiniana Dup. Should anyone be working light in the Fens or Broads in October, on the off-chance of something turning up, this moth and also *hastiana* should occur in numbers. The second brood of *lorquiniana* is much the more abundant and the examination of a large number of specimens at light should result in the capture of a series of the scarce diagonally striped variation. I wonder if anyone has systematically worked the Broads in October; it may be that new discoveries are not confined to Ham Street and the Burren. My late friend W. S. Gilles and myself tried two paraffin vapour lamps at Barton in October 1936, when we were staying at Wroxham pike fishing. but one night was cold and windy and the next raining, and all we saw were a couple of worn *G. flavago* (*ochracea*) and a belated *N. typhae*.

Notes on Lepidoptera, 1952-53

By F. M. B. CARR.

The long and dreary winter of 1952-53 gave rise to some wishful thinking on the part of hibernating lepidopterists as they crouched over their fires. Might not this winter turn out to be of sufficient severity to introduce us to a spring, summer and autumn in which the countryside should once again abound in "all things bright and beautiful" to the moth-hunter's eye? Not a bit of it! There was the usual multitude of creatures that bite and suck, and maybe our dipterists rejoiced thereat, but the mere butterfly man went forth again and again with very little to show for his efforts other than a new collection of mountains and molehills on his long-suffering person. Why do we persist? Because there is in all of us something of Mr. Micawber still.

But to return to the winter of our wishful thinking. It is well to try to make a bit of hay even when the sun does not shine. Even in the dreary winter, when most of our pupae and hibernating larvae must bide their time in cold storage, there are larvae also that may be persuaded by the use of artificial warmth to be extremely active. Amongst these is that very lively fur-coated little fellow *Parasemia plantaginis* L. My friend Dr. H. King kindly gave me last autumn 10 larvae of this species from an ab. *hospita* strain. These I placed in ordinary metal boxes with glass lids on the mantelpiece of a room where there is a fire day and night, the temperature ranging round about 65° F.

As I succeeded in bringing only five of them through I was very lucky to get a pairing. A female emerged on 4th December and the next day a typical male. They had paired when I looked at them at 8.45 p.m. on 6th December. Eggs were laid on 7th December and hatched on the 16th. Meanwhile two males and a female emerged, one male being *ab. hospita* and the female having nearly white under wings. The males described as typical are very much more heavily marked with black on all four wings than any of my Dorset specimens.

The 2nd generation larvae were treated in the same way and fed as before on groundsel. They began to spin up on 4th February. Moths emerged from 14th February to 19th March. Males numbered 17, of which 13 are *ab. hospita*, and females 12. On 23rd February one of the *ab. hospita* males paired. As a large number of eggs were laid I thought I was in clover. Alas! this was the beginning of the end. Only 15 larvae hatched, the bulk of the eggs proving infertile.

The 3rd generation larvae staged a series of hunger-strikes and eventually all expired, some of them lingering on to a time when all self-respecting little Wood Tigers should, in a state of nature, have become pupae.

Considering the not very congenial conditions I was surprised to find larvae of *Arctia villica* sunning themselves as early as 25th February at Bournemouth. Persistent cold winds made spring collecting most unprofitable. Over large tracts of the New Forest the young foliage of the oaks and beeches was ruined by a severe frost in May, and for many weeks afterwards the trees presented a melancholy spectacle. During three evening visits to the Forest with Dr. King in early to mid-May a few *Notodonta anceps* Göze (*trepida* Esper), and some *Eupithecia irriguata* Hb. and *E. indigata* Hb., came to light.

On 13th May Mr. H. Symes and I, visiting the Forest by day, beat long and fruitlessly for larvae. One larva of *Nola strigula* fell to my tray. This is a species that we hardly ever see in the Forest in these days. In 1900 I beat 38 larvae of this species in two days at Holmsley and in Hurst Hill.

On 21st May Dr. King and I went to the Test Valley to look for larvae of *Plusia chryson* Esp. Our bag was a very small one, the total being 4.

At Studland, Dorset, on the 26th May, *Lobophora halterata* Hufn. was very restless in an absolute tangle of aspen. It was almost impossible to follow up once it had skipped off an aspen trunk.

On 28th May Dr. King, Mr. Symes and I repeated our expedition of last year into Wiltshire for larvae of *Apatura iris*. This time none of us got any. It was nevertheless an interesting day. *Eulype hastata* was flying fairly freely and *Cepphis advenaria* flew up from time to time. We devoted our attention, however, to larvae. These were more plentiful here than in most places. They included *Thecla quercus*, *Lymantria monacha*, *Trichiura crataegi*, *Poecilocampa populi*, *Pseudoips bicolorana*, *Bombycia viminalis*, *Griposia aprilina*, *Brachyonychia sphinx*, *Orthosia miniosa*, *O. munda*, *Catocala sponsa*, and *Biston strataria*.

On 3rd June we three had a day in Hampshire in pursuit of *Acosmetia caliginosa*. It was either very scarce or very disinclined to fly up,

and only two were secured. Mr. Symes and Dr. King wisely turned to something else, and by diligent searching of the dewberry found quite a number of larvae of *Nola albula* Schf. They also found larvae of *Brepheos notha* on the aspen.

On 6th June Mr. B. C. Barton took me to Hod Hill, Dorset, where *Euphydryas aurinia* was up to sample, and *Lysandra bellargus* showed a distinct improvement in numbers on last year. *Procris geryon* was just appearing.

With the last week of June began a memorable time. The weather was hot and fine, and I had the good fortune to be staying with my old friends Mr. and Mrs. S. Gordon Smith in Chester. To collect once again with Mr. Smith 'on his own heath', i.e. North Wales, Cheshire and Shropshire, was a joy. On 25th June we went to Whixall Moss in the morning and there acquaintance was renewed with *Coenonympha tullia*. *Argynnis selene* was abundant, as was *Perconia strigillaria*. In the afternoon we switched on to Denbighshire and took the local form of *C. tullia*. A few belated *Apatele menyanthidis* were sitting about, including a fresh female.

The next day we began with Merionethshire, a glorious drive through the mountains. This proved to be the red-letter day of my season. Again *C. tullia*, also single examples of *Venusia cambrica*, *Scopula ternata* Schr. (*fumata* Steph.) and *Hepialus fusconebulosa*. A local thunderstorm cut short our operations and Mr. Smith whisked us off, and hey presto! we were soon enjoying the sunshine in Caernarvonshire. Here we worked a fine large race of *Plebeius argus* L. (*aegon* Schiff.), of which I got two nice male aberrations. *Jaspidia pygarga* Hufn. was fairly common and I also took *Rivula sericealis*, *Eulype subhastata*, and two small larvae of the same species on bog myrtle, whereon were also a number of larvae of *Orthosia gracilis*.

As it appeared to be an ideal night for light, Mr. Smith turned on the current and we enthusiastically stood on guard till 1.30 a.m. We had a busy time and of the crowd of moths that arrived the following were the most notable:—*Deilephila elpenor*, *Stauropus fagi* (3), *Noto-donta dromedarius*, *Tethea fluctuosa* (12), *Apatele alni*, *Polia tineta* (3), *Anaplectoides prasina* and *Hadena contigua*.

We had a wonderful drive back to Chester, the moonlight being just sufficient to show up the mountains and the white mist in the valleys. As the day began to break, though we sped along, snatches of the dawn chorus reached us. Somewhere between 5 a.m. and 6 a.m. we tumbled contentedly into bed.

(To be continued.)

Notes and Observations

HABITATS OF PARARGE AEGERIA LINN.—Anent the interesting correspondence in the *Record* about *Pararge aegeria* L. in open spaces and gardens, for some years a small number of this species has regularly frequented my garden here from April till September. Although there are various evergreen shrubs, hedges, etc., providing ample shade, I notice that the butterflies invariably choose sunny places in which to settle. Indeed they appear to revel in the sun, for those of the spring brood can be seen basking on the bare earth of the potato patch before

the plants are up, while in summer they settle on *laurustinus* and other foliage, always ignoring the shady sides for those in full sunlight. On 8th August of last year I noticed an odd bleached looking specimen of *P. aegeria* on the wing in the garden. On examination the right fore-wing and left hind wing of this butterfly—a male—were seen to be of a pale greyish brown while the left fore wing and right hind wing were the normal colour. The markings of the affected wings were white. The left hind wing was limp and inclined to curl, making it by no means easy to set.—BOLINGBROKE, Moorhayes, Crow Hill, Ringwood, Hants. 17.viii.53.

— Yesterday, 3rd September, I noticed a somewhat worn specimen of the above species feasting on a decaying plum upon a bare patch of earth in full sunlight in my garden. There could be no mistake about the identity of the insect, for I got to within a yard of it and clearly saw the insect imbibing. Though this may be a known habit of *P. aegeria* I had not previously seen or heard of it feeding on rotten fruit, and it struck me as being an observation worth recording.—BOLINGBROKE, Moorhayes, Crow Hill, Ringwood, Hants. 4.ix.53.

A MIGRATION OF *NONAGRIA DISSOLUTA* TR.—On 6th August 1953 I took 2 *Nonagria dissoluta* in my m.v. light trap at Ashridge, Herts., and on 7th August 3 more, all females and all ab. *arundineta* Schmidt. In my garden, situated on the side of Tring farthest from the reservoirs, I took 6 females on 6th August and 30 (4 ♂, 26 ♀) on 7th August, one being a typical *dissoluta* (melanic). There were none on the preceding and following nights. There are no reeds within several miles of the Ashridge trap. My father never took the species at the reservoirs, although he collected there assiduously, and in recent years neither Mr. Tite nor I have seen it there. The Ashridge trap is about 4½ miles from the one in my garden. The most probable explanation of the occurrence of so many *dissoluta* on the same two nights at places so far apart seems to me to be that a large migratory horde passed through the district; an unusual feature of the migration is the great preponderance of females. These females are more robust than Kent and Hampshire specimens and I think they were of Continental origin. Did anyone else observe this migration?—A. L. GOODSON, 26 Park Road, Tring, Herts. 13.viii.53.

ORIA MUSCULOSA HÜB. IN GLOUCESTERSHIRE.—On 6th August 1953 I caught a specimen of *Oria musculosa* at light at Bourton-on-the-Water, Gloucestershire, at an altitude of 450 feet above sea-level.—C. RENFREW, Lanhill, Bourton-on-the-Water, Glos. 13.viii.53.

CLOSTERA ANACHORETA SCHIFF. IN KENT.—I have to report the capture of a fresh male specimen of *Clostera anachoreta* near the South Kent coast on 9th August 1953. The moth came into an hotel bedroom illuminated by a Crookes' glass mercury vapour lamp sometime during the night of 8/9th August and was found at rest on the wall of the room next morning. It was 'bottled' on the assumption that it was an ordinary chocolate-tip and its identity was not discovered till it was set. The black spot on the fore wing and the crooked white line through the chocolate tip were then noticed for the first time. The specimen

was seen by the Baron de Worms, who confirms the identification.—G. F. JOHNSON, Castlesteads, Brampton, Cumberland. 25.viii.53.

AN ABERRANT LARVA OF *LAOTHOE POPULI* LINN.—While removing caterpillars from some willow cuttings I have growing here today I found a Poplar Hawkmoth larva with a double row of red spots—something I have never seen before. There are two rows of seven red spots along each side of the back, and another pair just before the 'tail', besides the ordinary red spots on the spiracles. This has been a poor season for Lepidoptera here and the only noticeable feature is the very large number of *L. populi*, *Cerura vinula*, and *Notodonta ziczac* larvae seen, on poplars and willows of my own planting.—J. L. CAMPBELL, Isle of Canna, Scotland. 26.viii.53.

EUBLEMMA PARVA HÜB. IN SOUTH LONDON.—As I was moving into my new home in Dulwich on 17th August I boxed a small moth on the fence, which I was at first unable to identify. After more careful examination its identity as *Eublemma parva* Hüb. soon became apparent. The position of the wings at rest was typically Noctuid. I understand that there was a considerable migration of this rare moth on the East Coast of Kent earlier in the year, more than thirty specimens having been recorded in m.v. light traps and at least two being taken further inland.

The date of this capture seems to indicate that my specimen was not an immigrant but a product of the second brood, bred in this locality. Mr. Bretherton in his Note published in the August number of the Record (p. 216) says that there is no evidence that the species has ever bred in this country. This latest record from the Greater London area would appear to point to a different conclusion.

The specimen itself is in perfect condition and my friend Mr. S. Wakely kindly exhibited it for me at a recent meeting of the South London Entomological Society. I agree with Mr Bretherton that it bears a superficial resemblance to a Tortrix of the *Phalonia* genus. The colour is much lighter than that of South's figure in the second volume of his *Moths of the British Isles*; but I have had no opportunity of comparing it with Continental specimens.—CANON T. G. EDWARDS, 93 Alleyn Park, Dulwich, London, S.E.21. 29.viii.53.

EUBLEMMA PARVA HÜBNER IN DEVON.—On 15th August 1953 I took a small specimen of *Eublemma parva* Hüb. in good condition at my m.v. trap at Torcross, S. Devon. It must belong to the second brood.—H. B. D. KETTLEWELL, Dept. of Zoology, Oxford. 14.ix.53.

EUPITHECIA PLUMBEOLATA IN DORSET.—This "pug" is not recorded in Parkinson Curtis's List as occurring in Dorset. On 22nd July 1952 I collected a large bunch of flowers of cow-wheat in Holt Forest in the Wimborne area and 5 days later found on it two stumpy larvae nearly full grown which fitted the description and pictures of the larva of *E. plumbeolata*. The imagines failed to emerge in 1953 but on visiting the locality on 31st May and 18th June I took single specimens of the imago on each occasion at late dusk. On 26th June I collected a large bunch of cow-wheat in this locality and kept it in water till 3rd August, when I beat out from it 6 larvae of this species.

On 11th June 1953 I was in the Dolgelley, Merionethshire, neighbourhood where cow-wheat is plentiful and walked up a specimen of *E. plumbeolata* in the afternoon sun. On returning to the locality at 5.30 p.m. S.T. I found there was a flight of *E. plumbeolata* and I was able to secure 11 specimens in a few minutes.

In Fassnidge's List (*Ent. Rec.*, 1923-25) *E. plumbeolata* is not mentioned as occurring in the New Forest. This year I took it in Holmsley Inclosure and at Shirleyholmes.—HAROLD KING, D.Sc., F.R.S., Parley Cross, Dorset. 23.viii.53.

EUPITHECIA SATYRATA FAGICOLARIA ROBSON AND GARDNER AND *E. VALERIANATA* IN DORSET.—According to W. Parkinson Curtis there are few reliable records for *E. satyrata* in Dorset. Wishing to complete my series of *E. valerianata*, in 1951 I collected many flower-heads of *Valeriana officinalis* in widely separated parts of the Stour valley in July but failed to find a single "pug" larva; but when I collected heads of this plant on the chalk in and about Cranborne Chase I found large numbers of "pug" larvae, apparently of more than one species. Many were stung but in May and June 1952 I bred many *E. valerianata* with 6 specimens of a larger pug which I could not identify. Mr. D. S. Fletcher of the British Museum (Natural History) very kindly examined their genitalia and identified them as the southern form of *E. satyrata* known as *E. satyrata fagicolaria*. There were 5 females and one male. As far as I have been able to ascertain, *V. officinalis* has not been recorded as a food-plant for this species.

This year larvae of *E. valerianata* were very scarce in the Cranborne Chase area, but larvae were present on *V. officinalis* which are probably *E. satyrata* and *E. castigata*.—HAROLD KING, Parley Cross, Dorset. 23.viii.53.

CIDARIA OTREGIATA IN WALES.—On 9th June 1953 I was dusking at the roadside on the exact border of Merioneth and Montgomery, a few miles north of Machynlleth, when I netted a fresh specimen of the above species of a slightly darker colour than those I have taken at Starcross in Devon.—HAROLD KING, Parley Cross, Dorset. 23.viii.53.

A NOTE ON BREEDING *COLIAS CROCEUS* FOURC.—At one time I did a considerable amount of breeding *Colias croceus* but found that it was not an infrequent occurrence to fail to obtain what I considered a really good batch of eggs from a female which was caged in the ordinary way with the foodplant. I experimented and found that the only way of ensuring a really good 'lay' was to put the female in an ordinary deep type of 3-in or 3½-inch glass-topped metal box with a couple of small sprigs of fresh lucerne and then prop the box up on a windowsill so that as much sun as possible struck the glass. To prevent too much condensation the lid was put on sideways so that there was a fairly good crack round the upper edge to allow for ventilation, but of course not large enough for the insect to get out. The tin of course got very hot indeed, but females kept in this way laid large quantities of eggs invariably. They used to flutter and bang themselves about a great deal but it never deterred them from laying continuously. The sprigs of lucerne had to be rather small and had to be changed fairly frequently as they began to wither and became covered with eggs. The insects

never damaged themselves to such an extent that they died as a result or became unduly tattered. It was necessary to put the boxes in a cool shady place occasionally to give females a rest, and feeding was done by hand about three times a day. The insect was held by the wings between finger and thumb in the left hand with its feet in contact with a wad of cotton wool well soaked in sugar and water, while its proboscis was carefully uncoiled with a pin in the right hand and its tip placed in contact with the cotton wool pad. The insects were usually so thirsty that they at once began to drink and continued to do so naturally when the wings were gently released, provided the operation was carried out in a cool shady room. They usually continued to feed for quite a considerable time and then began to fly about in the room, when it was an easy matter to catch them and put them back in their boxes after washing off any encrustation of the sticky sugar solution on their feet with a few drops of ordinary water squirted out of an eye dropper. This method never seemed to interfere with the fertility of the eggs and I was able to rear large broods which provided interesting data with regard to the relative percentages of the sexes and of the proportions of the *helice* and other forms of the females in a brood as the result of in-breeding and cross-pairing while on one occasion a very handsome gynandrous example appeared. It was, however, never possible to carry the experiments through the winter as it was not found possible to keep the insects warm enough and with enough light to induce pairing with the facilities at my disposal at the end of the year and specimens emerging from the pupa under artificial conditions in the early winter were usually undersized and weakly. It was not difficult to keep the insects alive for considerable periods with the methods employed.—R. E. PARSONS, Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. 28.viii.53.

THALERA FIMBRIALIS SCOPOLI IN KENT IN 1953.—I observed this insect again this year in the Denge Marsh district of Kent. Thus, it has now been noted annually in this neighbourhood for the last four seasons, having been first seen here in 1950.—J. M. CHALMERS-HUNT, 70 Chestnut Avenue, West Wickham, Kent. 19.viii.53.

ALCIS (CLEORA) JUBATA THUNB. IN SOMERSET.—I have pleasure in reporting that a perfect specimen of *Cleora jubata* Thunb., a male, turned up at my m.v. light on 7th August at Brockley Coomb, Somerset (about ten miles S.W. of Bristol). I have heard of no previous record for this district.—F. J. STONE, 79 Reedley Road, Bristol, 9. 10.viii.53.

OXYPTILUS PILOSELLAE ZELL. IN GLOUCESTERSHIRE.—I have also to report that I have just identified a small Plume which I took at Hallen, Glos. (on the banks of the Severn) in July last year as *Oxyptilus pilosellae* Zell. The single scale-tooth mentioned by Beirne (*British Pyralid and Plume Moths*, 1952, p. 163) is unmistakable.—F. J. STONE, 79 Reedley Road, Bristol, 9. 10.viii.53.

HIBERNATION OF PLUSIA FESTUCAE L.—An Old Moth-Hunter asks (*Ent. Rec.*, 65: 199) where, and in what stage, does *Plusia festucae* hibernate? He seems to have been singularly unlucky with this species or he would know the answers to these questions himself. As an old

moth hunter myself I can claim to have taken this species, not once, but many times. I have netted it from campion bloom in the dusk of a summer evening and taken it from street lamps in August. I have also bred it from larvae and pupae found in the wild and from ova laid by captured ♀♀, so can speak from some experience. The species is by no means common, here in the south, but it occurs more or less regularly every season. A second brood emergence occurs, too, sometimes about August, but it is then only partial, much depending upon weather conditions.

P. festucae never in my experience goes over the winter as a pupa. The larvae go into hibernation while still quite small in curled leaves and hollow stems on and about the food plant upon which they have fed. They recommence feeding as soon as the new growth appears the following spring.—A. T. POSTANS, 13 Stanfield Road, Bournemouth, Hants. 3.viii.53.

[The Old Moth-Hunter writes: "Much obliged to Mr. Postans. I hope he will lose no time in giving readers of the *Record* a full account of the life-history of this species from his observations and notes. As he will have seen from Mr. Lempke's paper in the September issue the life-history of *P. festucae* is equally unknown on the Continent.

"Do Mr. Postans' observations on hibernation sites, viz., 'curled leaves and hollow stems on and about the food plant', refer to larva-cages, or has he found the young larvae in these situations in the wild in wintertime? And what are the hibernation sites when the larva feeds on aquatic plants (e.g. *Alisma*, *Sparganium*)?"']

ORIGIN OF *GONODONTIS BIDENTATA* AB. *BOWATERI*.—I have just seen Lt.-Col. W. Bowater's *Gonodontis bidentata* Clerck bred during the last four years and it is clear that both the accounts of the origin of the pale border of ab. *bowateri* Cockayne, published in this journal, 1952, 64: 334, and 1953, 65: 222, are incorrect. There is no evidence that this form occurred in Bowater's early broods recorded in 1915, and it is not the usual form on Cannock Chase, but is a rare one. In 1949 Mr. G. B. Manley gave Lt.-Col. Bowater 18 pupae from a pairing between two melanic specimens from Cannock Chase. All the offspring were melanic and a male and a female had the pale border on the under side and several had pale fringes. Four brother and sister matings were obtained, all of which produced some *bowateri*. This does not prove whether the mutant is recessive or dominant, but definite evidence is afforded by a pairing between a wild normal male from Birmingham sent by Mr. Stanton and a melanic female *bowateri*. This male shows no trace of a pale border. Specimens of *bowateri*, however, appeared amongst the offspring, which could not have happened unless *bowateri* is dominant. All his other broods are consistent with this interpretation. The normal female from Torquay was received from Mr. F. H. Lees after *bowateri* had been bred and I cannot understand why this insect was mentioned.—E. A. COCKAYNE, Tring. August 1953.

IMMIGRATION OF *VANESSA URTICAE* LINN.—During last week-end there was a very marked increase in the numbers of *Vanessa urticae* L. at Weston. This butterfly was present in normal numbers last week, but by the morning of 6th September was feeding at flowers in a nearby

public garden in hundreds, and by the afternoon in thousands. The numbers were so great that the fact was commented on by members of the general public with no particular interest in butterflies. No doubt there has been a large migration from abroad.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 7.ix.53.

DAPHNIS NERII LINN. IN DORSET.—A female specimen of this insect was taken on board H.M.S. Implacable in Portland harbour on 7th September 1953 by Lieut.-Commander N. R. Benson, who gave it to me two days later. I put some sprigs of variegated periwinkle leaves with it in a roomy box and on the edges of these it laid three pale green eggs.—HAROLD KING, Parley Cross, Dorset. 12.ix.53.

PAPILIO MACHAON LINN. IN KENT.—On 15th August 1953, a warm sunny day, I took a large ♀ *Papilio machaon* in my garden here about 11.30 a.m. The insect was in a very weak condition and had a piece torn out of the left hindwing, including the 'tail'. I endeavoured to obtain eggs, but without success, and I also failed to induce it to eat sugar-water. After an hour or so the insect seemed likely to bash itself to pieces in its attempts to escape, so I decided to preserve it for the cabinet. The alar expanse is at least 96 mm.—J. L. ATKINSON, 76 Northwood Road, Tankerton, Kent. 11.ix.53.

PSEUDOIPS BICOLORANA FUESS. IN SOMERSET.—On the night of 10th July 1953, I had the good fortune to take a specimen of *Pseudoips bicolorana* Fuess. in a makeshift m.v. trap at Bath. South does not give a very clear indication of the status of this species in the West Country and I should be grateful if anyone could let me have further information about its distribution. Also I should be glad to know if it has an alternative foodplant to oak, as there are but two or three oak trees within a mile of the trap.

Since writing the above note I have been informed by my friend Mr. J. K. C. Kemp, of Bath, of the capture of a fresh ♀ specimen of *bicolorana* at his house at the end of June this year.—J. E. THORPE, 20 Kendal Green, Kendal, Westmorland. 5.ix.53.

[Barrett (*Lep. Br. Is.*, 2: 180) gives the distribution of *P. bicolorana* Fuess. as Kent, Sussex, Surrey, Hants, Berks, Hunts, Herts, Middlesex, Norfolk, Suffolk, Cambs., Essex; very uncommon in Devon, Somerset, Gloucs.; rare in Hereford and Worcs. The only recorded foodplants in this country, so far as we are aware, are oak, birch and sweet chestnut. The Continental authorities give only oak and birch.—ED.]

LAPHYGMA EXIGUA HÜB. AT WESTON-SUPER-MARE.—It may be of interest to record the capture of a specimen of *Laphygma exigua* in my moth trap at Weston-super-Mare on 1st August last.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare, Somerset. 2.ix.53.

YELLOW BURNET MOTHS IN HAMPSHIRE.—Further to my note in the September issue of *Ent. Rec.* details have been brought to my notice of three additional feral imagines of *Zygaena filipendulae* Linn. ab. *flava* Robson (*cerinus* Robson and Gardner) collected this year at Shawford Downs, as follows:—25th July, one, Robert W. Watson; 25th July, one, Mrs. N. I. Watson; 3rd August, one, Ian G. Farwell. The July

insects were taken within ten minutes of each other, and all three were in a newly-emerged condition.—PAUL H. HOLLOWAY, Warwick House, Fair Oak, Eastleigh, Hants. 2.ix.53.

PROBABLE SECOND BROOD OF *LIMENITIS CAMILLA* LINN.—While collecting butterflies on the North Downs at Magpie Bottom, near Shoreham, Kent, on 9th August 1953, I was surprised to see an apparently freshly emerged *Limenitis camilla* L. at bramble blossoms. In view of the date and its condition it is probable that it was a second-brood example. In this connection, it is interesting to note that I saw two worn *camilla* in the same locality on 19th August 1951.—J. F. BURTON, 43 Eversley Road, London, S.E.7. 12.viii.53.

CHILODES MARITIMA TAUSCH., *LEUCANIA STRAMINEA* TREITS., AND *EUSTROTIA UNCULA* CLERCK IN YORKSHIRE.—On 9th July and 21st August 1953, I took two specimens of *Chilodes maritima* in a locality about five miles from Selby, Yorks. On the 24th July in the same locality I took several specimens of *Leucania straminea*. This species has only recently been discovered in Yorkshire at Askham Bog, I believe *C. maritima* is a new record for Yorkshire.

On 17th June 1952 I took a perfect specimen of *Eustrotia uncula* on a small area of marshy land about three miles from Selby and saw one or two others. Unfortunately much of the ground has now been ploughed and is in danger of being destroyed as a habitat. I saw none in 1953 and have not heard of anyone in recent times taking *uncula* in Yorkshire, though it has been recorded for Askham Bog.—S. M. JACKSON, 15 Westbourne Road, Selby, Yorks. 31.viii.53.

CELERIO LIVORNICA ESP. IN SOMERSET.—At about 8 p.m. on 5th September last I saw a specimen of *Celerio livornica* Esp. hovering over petunias here. It was quite easy to identify, as it was still quite light. This moth was of course fairly common here in September 1949 flying over petunias at about sunset or shortly afterwards.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 7.ix.53.

ANTS IN GALLOWAY.—There appear to be few ants recorded for the counties of Kirkcudbright and Wigtown in Galloway. On a journey on 10th-12th September 1952 through these counties the following species were recorded. In the rocky outcrops near the roadside above New Galloway, Kirkcudbrightshire, on the Newton Stewart road were found *Myrmica lobicornis* Nyl.*, *M. sabuleti* Meinert*, *M. scabrinodis* Nyl.*, *M. laevinodis* Nyl.*; the latter species was common under stones in a small sloping meadow by a stream; in one colony a pterergate was taken. *Lasius flavus* Fab.* and *L. niger* L. were abundant. *Leptothorax acervorum* Nyl.*, *Formica fusca* L. and *Myrmica ruginodis* Nyl.* were common and generally distributed. A specimen of *F. fusca* L. on the moor measured only 3.2 mm. in length (usual size 4-6.5 mm.).

At Luce sands, Wigtown, *Myrmica sulcinodis* Nyl.*, *M. ruginodis* Nyl.*, *M. scabrinodis* Nyl.*, *M. sabuleti* Meinert*, and *M. laevinodis* Nyl.* were present. The last species was common in the area by contrast with the Scottish Highlands where it is very local. *Lasius flavus* Fab. and *L. niger* L. were abundant. One worker of *Lasius alienus* Foerst.* was taken but no colony was found. However, several colonies

were found of the intermediate variety *Lasius niger* var. *alieno-niger* Forel.* The workers of these were light coloured but possessed a few scattered hairs on tibiae and scapes. On the coast at the Mull of Galloway one dealated female of *Myrmica lobicornis* Nyl.* was taken. In many colonies of ants in the area winged sexed forms were still present in large numbers, cold weather having prevailed for several weeks past. A shale heap near Drummore was also visited—this place abounded with ants but no uncommon species were found.

The species marked with an asterisk are believed to be new county records.—C. A. COLLINGWOOD, Evesham. 4.ix.53.

Collecting Notes

A NOTE FROM SUSSEX.—A fortnight's holiday in the Shoreham area from 25th July did not produce any exceptional results, but such field work as was done was anything but intensive. Night work was confined to 'dusking' along the shingle banks towards Lancing and to investigation of certain lights on the caravan site where I stayed. Along the shingle, flowers of ragwort, hogweed and valerian were quite productive and several *Procus literosa* Haw., *Scopula marginepunctata* Göze and *Epirrhoe galiata* Schf. were seen. *Procris furuncula* Schf. was in profusion and much variety, and *Plusia gamma* L. were plentiful. One *Heliothis peltigera* Schf. was netted as it was flying, quite slowly, over the stones. It was interesting to find *Ortholitha bipunctaria* Schf. commonly on the shingle as I had always assumed this insect to be peculiar to chalk and limestone. The majority of the typical coastal insects were conspicuous by their absence.

Round the lights were a number of *Arctia caja* L. and *Phragmatobia fuliginosa* L. in profusion. Surely this moth is much more plentiful than it was a few years ago. *Nola albula* Schf. and *Nonagria geminipuncta* Haw. were perhaps the most interesting insects at the lamps, and some *Eilema griseola* Hb. and *E. luridata* Zk. also turned up.

Three visits were paid to the famous "coridon ground" at the back of Shoreham, primarily to look for *Mesotype virgata* Hufn., but none was found. *Eremobia ochroleuca* Schf. was plentiful. About half a dozen males of *Colias croceus* Fourc. were noted and the large robber fly *Asilus crabroniformis* L. was also seen.

Each time this locality was visited other collectors were searching for varieties of *Lysandra coridon* Poda, as many as six being present on one day. Whenever the hillside could be seen from a distance at least one figure armed with a net could be detected. It seems amazing that any varieties can survive this intensive unnatural selection. Small wonder these specialists always seem to say that things are not what they were.

Remaining entomological excursions covered the Downs behind Lancing, but intensive cultivation has reduced the natural downland to those areas like Cissbury Ring which come under the National Trust and the slopes which are too steep to plough. Even the area round Chantonbury Ring is now overgrown with thistles and ragwort, and the well-known dew-pond seems to have been ploughed over. In spite of this *Argynnis aglaia* L. appears to be quite numerous, though it seemed strange to see it flying over cornfields. A clover field was covered with

countless *Nymphalis io* L., and *V. urticae* and other Vanessids appreciated the thistles. A specimen of *Ectropis bistortata* Göze was found on a post on the top of the Downs far from any trees, and *Abraxas grossulariata* L. also was seen on the top of the hills where it had probably fed on blackthorn. *Aphantopus hyperantus* L. was seen flying round Chanctonbury Ring. One or two colonies of *Melanargia galathea* L. apparently were flourishing, but one cannot but be apprehensive of the ultimate effects of the increasing cultivation of the Downs.—W. E. MINNION, 40 Cannonbury Avenue, Pinner, Middx. 10.ix.53.

COLLECTING IN LINCOLNSHIRE IN 1953.—The year started rather earlier than last, for *Gonepteryx rhamni* was seen in our garden on 8th March as against mid-April last year. This early promise, however, was not maintained. *A. cardamines* was more than a week later in appearing than last year and there were no migrants seen. But it was good to be brought a very late specimen of *C. palaemon* caught not far from here on 25th June. A search in the locality on the next day provided not even the sight of one, so it must have been a straggler. Various expeditions to woods adjoining this parish showed that *L. camilla* is now very well established and seems indeed to be increasing its range. The same woods also showed *T. quercus* and on one ash tree in particular they were very numerous indeed. Not far from Grantham *L. eóridon* was again to be found in numbers on 20th July.

I have not been able to visit this year the locality near Sleaford where *S. w-album* is found, but I believe collectors have drawn blank there. In view of the bad year it was a surprise to see a specimen of *P. malvae* on the wing in a wood near Bardney towards the end of July. *T. sylvestris* was also taken on that day in the same wood. *O. venata* has been extremely common. *A. selene*, I have recently heard, was found again near Bardney this year.

In view of the above I think we may say that we have had a fair season up here in Lincolnshire.—REV. P. C. HAWKER, Gautby Rectory, Wragby, Lincs. 11.ix.53.

DIPTERA

Observations on *Hemerodromia unilineata* Zett. (Dipt., Empididae).

By B. R. LAURENCE.

Few observations appear to have been published on the food of the Hemerodromiinae in the Empididae although Lundbeck in 1910 in *Diptera Danica* 3 says of the genus *Hemerodromia* that "they are certainly carnivorous and they no doubt use the front legs in capturing prey. Zetterstedt says: 'Victus e minorum Dipterorum rapina'".

Both sexes of *Hemerodromia unilineata* Zett. were found commonly on 13th July 1953, beside Ludford Bridge at Ludlow, Shropshire, walking in a delicate manner over and under the leaves of shrubs growing at the water's edge. One male of *H. oratoria* Fall. was also caught in the fifteen males and seventeen females of *Hemerodromia* captured. Male and female were found *in cop.* without prey. Males showed a certain

aggressiveness towards other males. Two males facing head on and separated by a distance of about half an inch advanced and retired alternatively three times before one male flew off onto another leaf.

Only males were found with prey and some of the prey observed were alive and struggling. All were small Diptera, but very few Empids were seen to feed relative to the numbers of Empids and possible prey present. The observations were made in the evening. The prey collected consisted of two indeterminate Chironomids, male and female, one female *Tanytarsus*, and two male *Pericoma*. During feeding the front legs appeared to be holding the prey, the other legs supported the Empid on the leaf. Two ineffectual attacks were observed on a small Braconid. The Empid appeared to see the prey at a distance, walked towards it, and then about half an inch away began to sway its body, reminiscent of a cat about to spring, before darting at the Braconid. A similar ineffectual attack was observed at a Psychodid. Aphids were numerous under the leaves but none appeared to be attacked. Two aphids were stalked but the Empids suddenly turned away and did not attack. An aphid was being sucked by a Heteropteran bug (*Anthocoris nemorum* L. det. R. Southwood).

The only other Hemerodromiid I have seen with prey was a female *Chelifera precatória* Fall. (? without antennae) at Malham, Yorks., August 1952, on a tree leaf with a black *Chironomus* larger than itself.

The active predatory habits of the Hemerodromiinae are in contrast to the habits shown by the Clinoceratinae, some of which feed on insects which have fallen onto the surface of water (see Lindroth, C. H., 1931, Die Insektenfauna Islands und ihre probleme, Zool. Bidr. Uppsala, 13).

I am much in debt to Mr. J. E. Collin who named the Empids.

COLEOPTERA

BIONOMICS OF *METOECUS PARADOXUS* L.—With reference to Mr. S. Wakely's note concerning this wasp parasite in *Ent. Rec.* 64: 93 (March 1952) I was interested to read an account of the larval habits of this beetle in Wood's *Insects at Home* (1872, pp. 151-154) extracted from a paper by S. Stone in *Proc. ent. Soc. Lond.*, 2nd January 1865. Mr. Stone's observations are confirmed by the later studies of Dr. T. A. Chapman, who is briefly referred to by E. Step in *Bees, Wasps and Ants* (Lond. 1846, p. 41). The larvae apparently feed continuously, attaining full growth within a few days. While the manner of feeding of the larvae has been thoroughly described, what is less certain is how the eggs or larvae are introduced into the wasps' nests. Mr. Wakely says that according to Fowler "eggs are laid in the autumn . . . and it was thought the larvae hatch in the spring . . ." This cannot be reconciled with E. Step's statement that "its (the larva's) progress from hatching to pupa occupies only one week", unless the eggs do not hatch until late in the summer as Stone found larvae in wasps' nests during August and early September. I have taken specimens of this interesting beetle emerging from dug out wasps' nests (*Vespa vulgaris* L.) at Ripple, Worcestershire, on 15th August 1951. According to the countryman who had been destroying these nests the creatures had been emerging for several days past.—C. A. COLLINGWOOD, Aston under Hill, Evesham, Worcs. 8.ix.53.

TRICHODES ALVEARIUS F. IN ENGLAND.—A specimen of this clerid beetle, which is said to be parasitic on *Osmia* and *Megachile* bees, was taken among peaches imported from Spain at Wyre Piddle, Worcestershire, in July 1953. T. G. Wood devotes a paragraph to this insect in his book *Insects at Home* (1872) which, according to his Preface, is "an account of the insects which inhabit England". This beetle, however, is not described by Joy in his *Handbook of British Beetles* nor listed by Kloet & Hincks in their *Check List of British Insects*, and there is little doubt that the specimen obtained at Wyre was an alien.—C. A. COLLINGWOOD, Ashton under Hill, Evesham, Worcs. 8.ix.53.

STRANGALIA AURULENTA FAB. IN DEVON.—Our attention has been drawn to Mr. R. S. Ferry's paper in *Ent. Rec.*, 65: 26-28. We are rather surprised to hear of his failure to find this beetle in Bickleigh Vale in 1948; the upper part of the Vale is one of our favourite haunts and *S. aurulenta* is a prominent enough insect there to impress itself upon one's attention. It seems that the larvae feed not so much on newly felled trees, for the beetle is common in an area that was cleared during the last war, but rather in the old logs with which the foresters used to construct the roadways that were built to remove the timber. We found a pair *in cop.* on one of these logs last Wednesday afternoon.

The late Dr. Stanley Kemp asked Mr. F. W. Jeffery for specimens of this beetle; that was about ten years ago. They collected eight during the course of two seasons but since then it seems to have become commoner in Bickleigh Vale. Mr. Jeffery has also recorded single specimens from North Tawton in central Devon and from the actual city of Plymouth.—DAVID HARE and PAUL JEFFERY, Plymouth. 11.viii.53.

Fifty Years Ago

(From *The Entomologist's Record* of 1903.)

ONISCUS AND ANTS.—On March 14th I had dug up my old nest [*Formica rufa*] as no ants had appeared this year. I found the bulk of the ants and several queens in a ball all joined together by mould, which had probably killed them. There were no living ants, but the remains of many were scattered about the nest, the work, I am inclined to think, of the common wood-louse, of which there were great numbers alive in the nest. This recalls to mind Mr. W. W. Smith's note . . . on the displacement of ants by woodlice in New Zealand. I think the woodlice take the opportunity when the ants are hibernating to eat them; they are evidently obnoxious to the ants, as I have written in my note-book, on October 20th, 1901, "A common woodlouse came up on to the hillock; it was attacked by two ants and killed".—H. DONISTHORPE.

A LARVAL PREDATOR IN NATAL.—*Charaxes ethalion* also has a terrible enemy in the larval state in the shape of a small Mantis larva. This butterfly, instead of being rather rare, would be one of our commonest species, as the ova and young larvae can be found by hundreds in April on certain small trees. After leaving them to grow in the natural state upon their foodplant, I was surprised, in the season of 1901, to find only single larvae here and there where there had been great numbers of

both ova and young larvae. This season I determined to find out the reason and marked down several young trees with hundreds of eggs upon them. After they had hatched I watched every day and found them getting less and less numerous, so I paid a visit by night with a lantern and then found the cause. On all the trees were several larvae of a Mantis eating the young *C. ethalion* larvae for all they were worth. This winter I have planted small trees in my garden and hope to breed *C. ethalion* next year by protecting it in 'sleeves'.—G. F. LEIGH, Durban.

EGGS LAID BY LEPIDOPTERA.—Herr Gauckler of Karlsruhe sends us a separatum . . . in which he has brought together a large number of statistics (nearly all from his own personal observation) of the average numbers of eggs laid by various species of lepidoptera, and the average percentages of moths bred. His general conclusion is that the smallest numbers are laid by Rhopalocera (with some exceptions, however, such as *Pieris brassicae*, *Aporia crataegi*, *Colias edusa*, Vanessids, etc.), then follow the Sphingids, Geometrids, Bombycids (*sens. lat.*) and Noctuids, individual females in the last two "families" sometimes yielding as many as 800 ova. He considers that the Geometrids repay the breeder best in the percentage of moths yielded.—J. W. TUTT.

Current Literature

ENTOMOLOGICAL PHOTOGRAPHY IN PRACTICE. By E. F. Linssen, F.Z.S., F.R.E.S., F.R.P.S. The Fountain Press. 32s 6d.

There are many entomologists who would welcome a book on insect photography, and this volume, written by an author who is both expert photographer and experienced naturalist, may prove to be of some assistance to some of them. The scope of the book is wide, ranging from stereoscopic work to photomicrography and embracing some elementary Entomology, with notes on collecting and rearing specimens.

The majority of entomologists, however, will probably be disappointed, for they will be looking for more guidance on the question of the apparatus required and more detailed instruction and suggestions as to the methods to be employed to overcome the problems inherent in this branch of photography. The references to lighting are somewhat confusing and there is little guidance on the arrangement and control of subjects and on suitable backgrounds to be used when, as is generally the case, the insects have to be photographed at home.

The chapters on photographic technique are insufficient unless some experience of photography is assumed, and they do not contain much that a practical photographer would not know already or be able to work out for himself. On the other hand the chapters on Entomology yield little that an entomologist will not have learnt by experience or from his standard reference books. In short, an entomologist wishing to photograph insects will find that the book contains much that has little bearing on his problems, to the exclusion of fuller information that would be of assistance to him.

Finally the cost of the book seems to be excessive in relation to its contents.

W. E. M.

APPENDIX

The Rothschild-Cockayne-Kettlewell Collections of British Lepidoptera

Remarks have been made during the last four years and are still being made, which show that entomologists, even those who are on the staff of the British Museum itself, have no idea how the Rothschild-Cockayne-Kettlewell collection originated or on what authority it was formed. In order to make this clear we are publishing the Agreement between the Trustees of the British Museum and ourselves, which was signed 10th May 1947.

An Agreement made the Tenth day of May, One Thousand Nine Hundred and Forty-seven, BETWEEN THE TRUSTEES OF THE BRITISH MUSEUM (hereinafter called the Trustees) of the one part and EDWARD ALFRED COCKAYNE of 8 High Street, Tring, in the County of Hertford, a Registered Medical Practitioner, and HENRY BERNARD DAVIS KETTLEWELL of Homefield, Cranleigh, in the County of Surrey, a Registered Medical Practitioner (hereinafter called the Donors) of the other part. Whereas 1—

- (1) The Donors have each formed a collection of British Lepidoptera which they have given to the Trustees.
- (2) The Donors each intend to give to the Trustees during their respective lifetimes such additional specimens of British Lepidoptera as appear to them to merit addition to the collections which they have given to the Trustees.
- (3) It is intended that the collections which the Donors have given to the Trustees shall be amalgamated with a collection of British Lepidoptera now held by the Trustees and known as the Rothschild British Collection in order to form together with such other specimens of British Lepidoptera as may from time to time be added thereto a single uniformly arranged collection to be named the Rothschild-Cockayne-Kettlewell Collection (hereinafter called the joint collection).
- (4) The Donors in making the said gift have expressed the wish that no specimen be removed from the joint collection after their deaths. And it is the intention of all parties hereto that no type specimens, examples of gynandromorphism, homoeosis or industrial melanism or any aberrations shall be removed from the joint collection at any time.

NOW IT IS HEREBY AGREED AND DECLARED as follows:—

- 1 (1) The Trustees shall permit the Donors to amalgamate the collections which they have given to the Trustees with a collection now held by the Trustees known as the Rothschild British Collection so as to form one uniformly arranged collection displaying the variation and genetics of British Lepidoptera which together, with such other specimens as may from time to time be added thereto, shall be named the Rothschild-Cockayne-Kettlewell Collection.

- (2) The Trustees shall give the Donors all reasonable facilities for carrying out such amalgamation.
 - (3) The Trustees shall forthwith take steps to provide ten cabinets of the J. J. Hill Unit System pattern uniform with those now in use by the Donors to enable the Donors to begin the work of amalgamation and shall from time to time provide such further cabinets as shall reasonably be required by the Donors for the purposes of the said work.
 - (4) The Trustees shall cause the Keeper of the Department of Entomology to make available for incorporation in the Rothschild-Cockayne-Kettlewell Collection such specimens at present contained in other collections of British Lepidoptera already the property of the Trustees as may add materially to the value and usefulness of the Rothschild-Cockayne-Kettlewell collection.
- 2 In connection with the said amalgamation the Trustees shall cause the following work to be done:—
- (1) The preparation of a detailed catalogue of the joint collection attributing each specimen to its original source and to its donor and the Trustees shall give consideration to the possibility of printing it when it is complete or at some other convenient time.
 - (2) The preparation and maintenance of a Register in which shall be recorded the names of donors of specimens to the joint collection other than the Donors, together with the particulars of their gifts.
 - (3) The publication from time to time of the entries in such Register in one or other of the entomological journals.
 - (4) The labelling of each of the specimens in the joint collection showing the name of the collection from which the specimen is derived.
- 3 (1) The Trustees shall, subject to their Regulations for the time being in force governing the making of loans of exhibits, permit the Donors to borrow from the joint collection from time to time for the purposes of study, exhibition or otherwise, such specimens as the Donors require.
- (2) Until the amalgamation of the said collections is completed the Trustees shall not without the consent of the Donors lend to any person any specimen forming part thereof.
- 4 The Trustees shall permit the Donors to publish descriptions and illustrations of any specimens in the joint collection which the Donors deem desirable to be published in the interests of science.

In WITNESS whereof the SEAL of the BRITISH MUSEUM has been hereunto affixed and the Donors have hereunto set their hands and seals the day and year first above written.

The SEAL of the BRITISH MUSEUM was hereunto affixed in the presence of

Crawford, Trustee.

Ilchester, Trustee.

SIGNED, SEALED AND DELIVERED by the said Edward Alfred Cockayne.

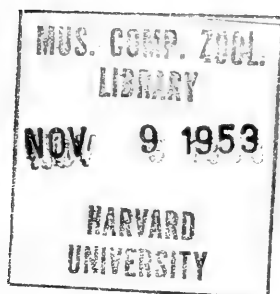
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E. A. Cockayne, H. B. D. Kettlewell.

SUPPLEMENT TO
THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION
OCTOBER 1953 (VOLUME 65)

PROBLEMS OF SPECIATION IN THE
GENUS *EREBIA*

BY B. C. S. WARREN, F.R.E.S.



Problems of Speciation in the Genus *Erebia*

By B. C. S. WARREN, F.R.E.S.

Some years ago my friend Prof. Z. Lorkovic consulted me on the identity of two new races of *Erebia* that he had discovered; one in the Durmitor mountains (Montenegro), the other from the Julian Alps. He suggested the former to be a race of *E. cassioides*, the latter one of *E. tyndarus*. From his photographs I was inclined to think the position reversed. Later, he gave me some specimens from the Julian Alps, and examination of these confirmed my previous impression, so far as that race was concerned. Recently, Prof. Lorkovic informed me (i.l), that his identification of these races had been confirmed by examination of the female genitalia, and that, on the same ground, he considered the races *hispania*, *goya* and *rondoui* to constitute a species distinct from *E. tyndarus*. His Durmitor race he holds to be close to *E. tyndarus macedonica*, and connects the latter with *E. cassioides transylvaniensis*. He further stated that the chromosome count demonstrates that polyploidy has taken place in the *hispania*-group of races, confirming their separation as specifically distinct from *E. tyndarus*. In this, however, he seems to be relying on the race of the Julian Alps as "*tyndarus*"; but if my view that it is a race of *E. cassioides* chanced to be correct, this would place a totally different interpretation on his data. Much, therefore, depends on the taxonomic value attaching to the female structural characters, and my previous investigations into these had left no doubt in my mind that in this groups of races these characters were valueless, so far as speciation was concerned. Prof. Lorkovic is publishing a paper on his work; had he kept me informed I would gladly have given him the photographs accompanying this paper, which might have inclined him to take a different view. As it is, the lack of accurate information on the subject necessitates their publication now. The present paper refers to the *tyndarus* and *cassioides* race-groups only; though from what I have seen similar conditions prevail in some other groups also. In the female structures the sclerotized parts of the 8th sternum, known as the "genital plate", provide the characters that are usually of most taxonomic value; it is recognized, however, that they are extremely variable. In spite of this there seems to be an idea that, in the group under consideration, a specific type of formation characterizes each species. This is a complete misconception. In actual fact there exists in each *race*, not one type, but two or even three types of formation; all of extreme variability; though most frequently these types segregate quite sharply. It will be shown that these complementary types of one race can appear severally, in another combination of types, in other races. This transmutation of type affects each race in these groups, so most types (? all) are representative of two species. If the *hispania* race-group is proved to constitute a distinct species, then

some types will be linked to three species; and probably more, if one were to extend one's researches into the *E. cullias* and *E. dromulus* groups. It is impossible to convey any idea of these fluctuating types in words. They must be illustrated to be appreciated. This is best done by photography, which gives a realistic impression of the individuality of formation and size of each specimen. The dual, or triple lines of development are apparent in the central process of the genital plate. This process can have plain or crenulated edges, vary endlessly in size, especially in width, and the development of the distal arms may be convergent, divergent or parallel; occasionally they disappear. In reading the following notes it must be kept in mind that every feature mentioned varies in practically every individual. I have no idea of the relative frequency of occurrence of the various types. It would need the dissection of many scores of specimens of each race to get anything approaching a true conception of this. *E. cassioides cassioides* (figs. 1, 2). Type 1, short, diverging, distal arms, springing from narrow base, appears in *E. tyndarus tyndarus* (12 and 16, the latter seems to be a variant of 8, many other variants exist), also in *E. tyndarus semimurina* (4); type 2, a featureless type, but losing none of the variability, especially in size, appears in *E. tyndarus semimurina* (3).

E. cassioides murina (figs. 5, 7, 10). Type 5, massive base, slightly curved, distal arms, passes into type 7, can have crenulated edges, appears in *E. tyndarus tyndarus* (8), *E. tyndarus hispania* (21), *E. cassioides* Julian race (24); type 10, massive, slightly diverging, distal arms, appears in *E. cassioides transylvaniensis* (26), *E. cassioides carmentis* (11), *E. tyndarus tyndarus* (12).

E. cassioides carmentis (a 3-type race, figs. 6, 9, 11). Type 6, crenulated edges, variant of formations appearing in *E. cassioides murina* (7) and *E. cassioides* Julian race (24), in *E. tyndarus tyndarus* (8), *E. tyndarus hispania* (21) and *E. tyndarus goya* (not shown); type 9, crenulate edges, thin, distal arms of all lengths, appears in *E. cassioides murina* with half-length arms (not shown); type 11, stunted with diverging arms, appears in *E. tyndarus tyndarus* (12).

E. cassioides dolomitensis (figs. 18, 19). Type 19, with long, diverging, distal arms, appears in *E. tyndarus tyndarus* (16) and *E. tyndarus macedonica* (22); type 18, a stunted variant of *E. cassioides murina* (10) and *E. cassioides* Julian race (17), shows the solitary, central perforation on left side of process, that appears in the Julian race (24) and *E. cassioides murina* (not shown) and *E. tyndarus goya* frequently. The size of type 18 is interesting when compared with that of type 17. The latter came from a specimen twice as large as that from which type 18 was taken.

E. cassioides transylvaniensis (fig. 26). A massif type similar to *E. cassioides murina* (10), the second type is slighter with curved, short, convergent, distal arms, appearing in *E. tyndarus tyndarus*, a variant of (8).

E. cassioides Julian race (figs. 17, 24). Type 24 with thin, slightly converging, distal arms, appears in *E. tyndarus hispania* (21), *E. tyndarus rondoui* (15) and *E. cassioides carmentis* (6). The marked, central, solitary perforation on the left edge appears, as noted, frequently in *E. tyndarus goya*. Type 17, massive and stunted, appears in *E. cassioides dolomitensis* (18) and *E. cassioides carmentis* (11).

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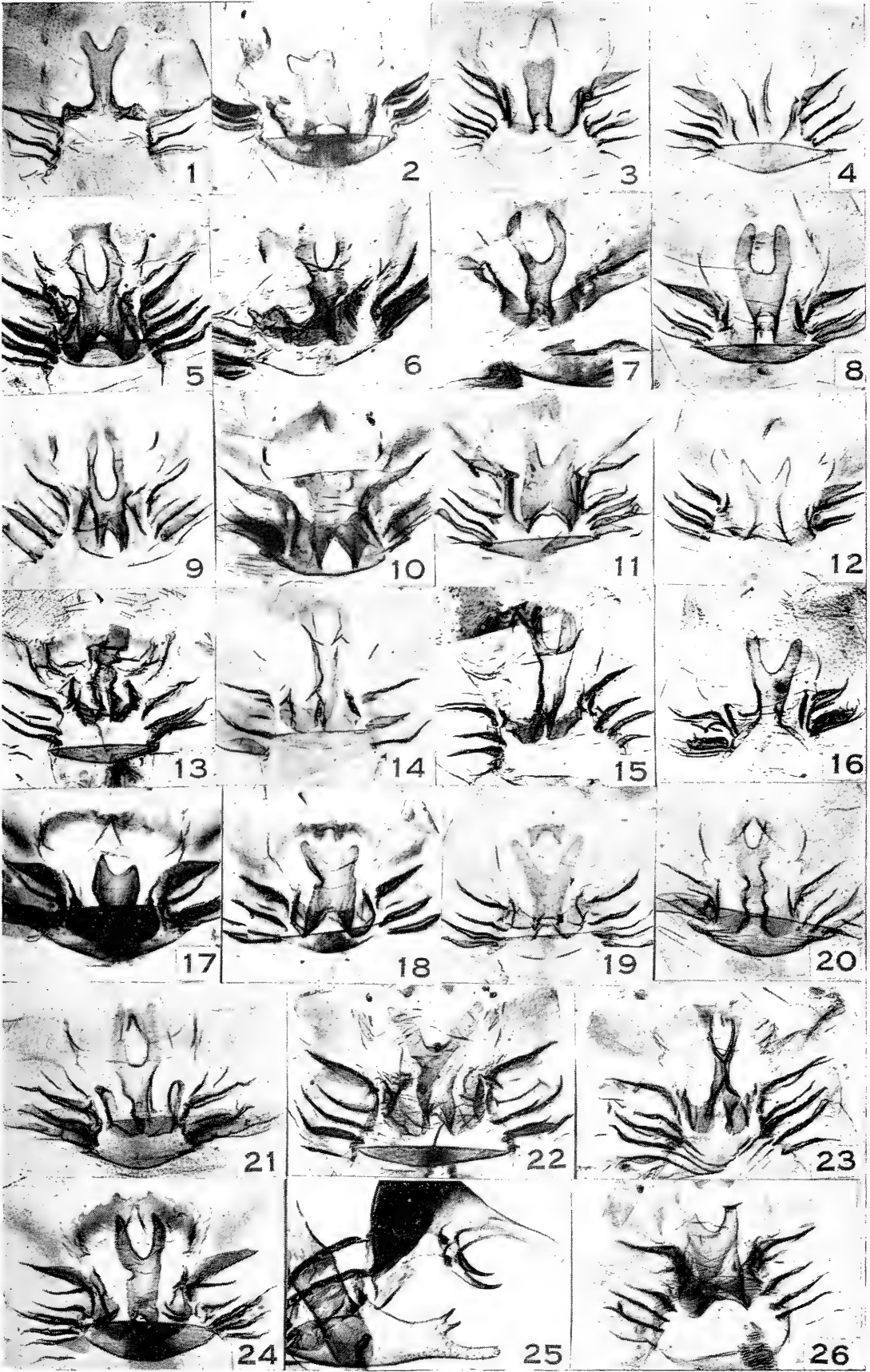
E. tyndarus macedonica (a 3-type race, figs. 13, 14, 22). Type 14, long in proportion to its width, crenulated edges and short, parallel, distal arms, appears in *E. tyndarus rondoui* (15), *E. tyndarus goya* (20); type 13, a remarkable, narrow type, solid at the distal extremity, appears in *E. tyndarus goya* in both widths illustrated; type 22, very massive compared with the other types, with long, diverging, distal arms, appears in *E. cassioides dolomitensis* (19).

E. tyndarus goya (a 3-type race, figs. 20, 23). Type 20, as mentioned, appears in *E. tyndarus macedonica* and *E. tyndarus rondoui*; type 23, a strangely spider-like type, with little body, seems unique (so far as my present researches go); the third type assumes the solid termination as in *E. tyndarus macedonica* (13), this appears in widths similar to both types 20 and 23.

E. tyndarus rondoui (fig. 15). This type has already been mentioned, the second type takes the formation as in *E. tyndarus semimurina* (4).

E. tyndarus hispania (fig. 21). I have only had one specimen of this race to examine, so do not know what formation the complementary type assumes.

To recapitulate briefly: the *E. tyndarus tyndarus* formations appear in *E. cassioides cassioides*, *murina*, *carmenta*, *dolomitensis* and *E. tyndarus hispania*; those of *E. tyndarus macedonica* in *E. tyndarus rondoui*, *goya* and *E. cassioides dolomitensis*; those of *E. tyndarus semimurina* in *E. cassioides cassioides*; those of *E. cassioides* Julian race in *E. tyndarus rondoui* and *hispania* and *E. cassioides dolomitensis*; those of *E. tyndarus goya* in *E. tyndarus macedonica*, and *E. cassioides carmenta* and the Julian race; those of *E. cassioides carmenta* in *E. tyndarus tyndarus*, *hispania* and *goya*. It is scarcely necessary to point out that no one type, or combination of types, will separate the *tyndarus* and *cassioides* race-groups as a whole; or even the *goya-rondoui* combination from either group, for the three types of *E. tyndarus macedonica* link them with both groups—*macedonica* 13 to *goya*; 14 to *rondoui* and 22 to *E. cassioides dolomitensis*; and a variant of *goya* 20 assumes the formation of *E. cassioides carmenta* 6. One need not labour the point; such features are but racial fluctuations, inconstant as the superficial facies of the races in which they occur. The only logical deduction that could be drawn from them would be that all *tyndarus-cassioides* races were conspecific. This, however, we know is not the case. These ever-changing developments of the genital plate are not in any way correlated to the phylogenetic race groups indicated by the male genitalia. So much is incontestable. The signa and spermatophores are at times of taxonomic value, but in this group there is no appreciable difference here either. As, unfortunately, these species do not develop androconial scales, we have to rely on the male genitalia for morphological data bearing on speciation. Little need be said on this point. The *E. cassioides* group of races, differ from the *E. tyndarus* group in the strongly-developed shoulder to the claspers. This is seen at its greatest development in the races *transcaucasica* and *murina*. In all races there is variation in the degree of development of the shoulder, and in such races as *E. cassioides cassioides*, *dolomitensis* and *subcassioides* it decreases, attaining a *tyndarus*-like form in the extreme examples. For this reason I did not separate the two species in my book, not having



the incontestable proof that was only discovered many years later. Fig. 25 shows the male genitalia of the Julian insect. Such a specimen could only be *E. cassioides*: no such formation has ever been seen in any race of *E. tyndarus*. Over the last 30 years I have examined many scores of specimens, and was able to draw on the experience and notes of the late Dr. Chapman and the late Prof. Reverdin, both of whom made really extensive researches into this question. I have only examined four specimens of the Julian race, but of this small number a second gave a slightly different, but equally typical *cassioides*-formation, the remaining two showing less pronounced forms, often seen in typical *E. cassioides cassioides*.

EXPLANATION OF PLATE.

Variation in genital plate of female in *Erebia* species of the *tyndarus* and *cassioides* groups. All photos $\times 18$.

1. *E. cassioides cassioides*, Hohe Tauern, Carinthia.
2. *E. cassioides cassioides*, Hohe Tauern, Carinthia.
3. *E. tyndarus semimurina*, Kandersteg district, Bernese Oberland
4. *E. tyndarus semimurina*, Kandersteg district, Bernese Oberland
5. *E. cassioides murina*, Gavarnie, Pyrenees.
6. *E. cassioides carmenta*, Six Jeur, Valais.
7. *E. cassioides murina*, Grammont, Valais.
8. *E. tyndarus tyndarus*, Taeschthal, Valais.
9. *E. cassioides carmenta*, Flégère, Chamonix Valley.
10. *E. cassioides murina*, Rochers des Naye, Vaud.
11. *E. cassioides carmenta*, Col des Montets, Chamonix Valley.
12. *E. tyndarus tyndarus*, Rosegtal, Engadine.
13. *E. tyndarus macedonica*, Rhodope Mountains, Bulgaria.
14. *E. tyndarus macedonica*, Rhodope Mountains, Bulgaria.
15. *E. tyndarus rondoui*, Pyrenees.
16. *E. tyndarus tyndarus*, Simplon Pass, Valais.
17. *E. cassioides*, race from Julian Alps.
18. *E. cassioides dolomitensis*, Karer Pass, Dolomites.
19. *E. cassioides dolomitensis*, Cingles Tal, Dolomites.
20. *E. tyndarus goya*, Canigou, Pyrenees.
21. *E. tyndarus hispania*, Andalusia.
22. *E. tyndarus macedonica*, Rhodope Mountains, Bulgaria
23. *E. tyndarus goya*, Canigou, Pyrenees.
24. *E. cassioides*, race of Julian Alps.
25. *E. cassioides*, race of Julian Alps, male genitalia
26. *E. cassioides transylvanensis*, Retezat Mountains

Photos B. C. S. Warren

As to the *hispania* group of races; anatomically they are indistinguishable from the *tyndarus* group. The chromosome number may solve the question, but the discovery of the Julian race of *E. cassioides*, proves that an eastern and a western race of that species have slightly different chromosome numbers; the Julian race 8, and *E. cassioides murina* 10. It cannot be held that there are sufficient physiological differences between these races to accept a difference of 2 in the chromosome number as an indication that the *cassioides* races divide into two species. The possibility of polyploidy appearing in *hispania* remains, but short of this it does not seem that much help can be derived from the chromosomes. The early stages are the most probable source of useful information. Prof. Lorkovic has been breeding many *tyndarus* and *cassioides* races, including the Balkan races and the western *rondoui*. If the

latter is a species distinct from *E. tyndarus*, this fact should be obvious, and no further support would be necessary. But will the early stages of *hispania* agree with those of *rondoui* or *tyndarus*?

Concerning the race of the Durmitor mountains, I have not had any specimens to examine. Prof. Lorkovic tells me this race is close to *E. tyndarus macedonica*, which seems natural enough, but this provides no reason for connecting the latter with *E. cassioides transylvaniensis*, which morphologically, is a very marked *cassioides* race; and *macedonica* is an equally marked *tyndarus* race. To turn to the female structures of course only confuses the question, and whatever the chromosome numbers may be in these two races, it will make no difference; even if they are identical in both, this could not be held to unite two such, anatomically, distinct races as conspecific; Prof. Lorkovic has shown in the past that many distinct species of *Erebia* have identical chromosome numbers. A slight difference in the numbers between *E. tyndarus tyndarus* and *macedonica*, would be of little importance either.

Whatever facts are obtained from the early stages, they will have to be of sufficient importance to be independent of morphological support, if they are to justify further subdivision of the *tyndarus* race group.

I cannot but regret that Prof. Lorkovic should have published his paper, without having cognisance of the facts relative to the female structures that are set out in this paper. However, even if this has led him to some unsound conclusions, the data he has derived from the early stages will remain as a basis for future work.



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AND JOURNAL OF VARIATION

EDITED BY
E. A. COCKAYNE
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Thalera fimbrialis Scopoli in England

The Discovery of Wild Larvae

By H. B. D. KETTLEWELL, M.B., B.Ch.

On 7th August 1952 I visited Dungeness, Kent, in the hope of getting a late ♀ of this species. I was unsuccessful, however, and records have shown that in this year they were on the wing as early as June.

On my last day I collected random samples of the heads of yarrow, *Achillea millefolium*, from a small area of the Ness. These were carefully cut and lifted into a wooden box. As this box was less than one foot square it stands to reason that only a few heads were taken, probably in the region of one hundred. The following day they were placed in a wooden cheese box and a bottle containing fresh *millefolium* was placed in the middle. The whole was covered by a muslin square; this is essential treatment as mould must be avoided at all costs.

In a few hours I commenced to find very small (second instar) larvae which could be recognised as 'Emeralds' because of their notched heads. Their colour was green. They had a peculiar habit of vibrating their bodies at high speed when disturbed and I used this effectively in finding them. Altogether seventeen were recovered. At the same time I picked up two larvae of *Eupithecia millefoliata* Ross.

The *fimbrialis* were transferred into glass-topped tins and fresh *millefolium* was given them each day. They grew rapidly throughout August, and when about $\frac{1}{2}$ -inch long in early September they changed their colour rather rapidly to reddish brown.

On 21st September they were all transferred to a large wooden cheese box which had been previously planted out with *millefolium* and grass. A muslin dome supported by wooden struts was placed over this and a slit some six inches long was made in this to act as an observation window. On this date the box was transferred to Major Collier's keeping, to whose subsequent success I am greatly indebted. It was placed in a cool greenhouse facing south but was in partial shade by the plants he grew near-by.

Major Collier kept record of all his observations throughout the winter and spring and he watered the yarrow about once a week, varying according to the season. He reported that in the first week a large number of predators, such as "spiders and dipterous larvae", became apparent in the box, and in our opinion they were responsible for the disappearance of many of the larvae. This, of course, is avoidable and the whole box should have been submerged in water for twenty-four hours before the introduction of the larvae. The highest number of *fimbrialis* counted after the 23rd of the month was five. On 22nd October he reported that they had taken up hibernation positions and that two of them had not moved for two weeks and were "rigid and straight on dead fronds of *millefolium*".

On 10th March they had left their hibernation positions and by the 24th he noted that two were feeding, growing and green in colour. He also made the important observation that they spent a great deal of their time sitting on grass. On 8th April one was taking up position for its last ecdysis and both attained full growth in May. They

pupated on the 24th and the 25th of the month respectively. One imago hatched on 29th June.

I think this is the first record of the species being successfully reared in this country though others have succeeded in overwintering them only to die near full growth.

On 2nd June this year I went to Dungeness with the advantage that I had seen full-grown larvae of *fimbrialis* in captivity. The first day I visited the identical patches of *millefolium* from which I had previously taken my samples. I found that very few of these were entirely free from grass growing among them. On one of these I found two full-grown larvae sitting on the base of the yarrow fronds. They were extremely difficult to see. I then concentrated my efforts on this patch, which was about two square yards in extent, and each leaf was picked separately; no further larvae were found here, however. Later on I repeated this with two further patches both with grass growing amongst them, spending about 2½ hours per patch. On no occasion did I find a larva after the first half-hour and I came to the conclusion that, though difficult to see, they are not overlooked if a concentrated effort is made. Subsequently four other larvae were found and some of them were sitting on the grasses and were unbelievably difficult to pick out. I think this is the normal habit of the larva. Two of them had their pink dorsal stripe missing which undoubtedly contributed to their downfall, and I am of the opinion that a colour-blind person might find the normal larva more easily than I did. The yarrow sometimes shows signs of the presence of a larva by the last inch or more being partially cut through so that it hangs down slightly withered.

I found the larvae over a considerable area of the Ness, and considering the large amount of suitable ground left untouched by me I came to the conclusion that the total population might be quite high. Two of the larvae were feeding in the shade of a willow tree. Several night expeditions were made to the Ness using both electric torch beam and paraffin vapour lamps, but no larvae were found by this method.

I handed over the six larvae to Dr. Cockayne, who blew two of them; one, a male, emerged 14th July and a second male 25th July; one died. Three of the larvae pupated quite high up on the yarrow, but I doubt if this is a usual habit. The pupa is a pale amber with conspicuous black markings and is enclosed in a frail cocoon.

It would appear therefore that the larva is easily acquired before hibernation (but not after), and by taking random samples of the *millefolium* in the late summer from localities (I would suggest the Crumbles at Eastbourne) we may be able to learn more about the true range of this insect on the South Coast.

[Three more larvae were found later by Messrs. H. S. Robinson, Robin Mere, and A. L. Goodson. Mr. Goodson says that the larva is difficult to find because there are innumerable little plants of yarrow growing amongst a tangled mass of grass all over the breeding ground. Many food-plants are given in books, including thyme and birch, but the only reference I have seen describing the finding of wild larvae is one I found in the winter of 1952 after Dr. Kettlewell had discovered

the young larvae. Boldt (*Int. ent. Z.*, 1929, 23, 273) found larvae in Germany, after over-wintering, half grown on *Achillea millefolium* and *Rumex acetosella*.—E. A. COCKAYNE, Tring.]

Description of the Larva

By E. A. COCKAYNE, D.M., F.R.C.P.

The larva is long, slender, and smooth, tapering a little towards the head. The head is dark red and bifid with unusually long sharp spikes even for an 'Emerald'; the spikes or spinous processes are red externally and green in front and behind; on the prothorax are two more long spinous processes, green with the distal half red. The thorax has a narrow dorsal red stripe; the abdomen has an uninterrupted broad red dorsal stripe ending just before it reaches the anal plate; the anal plate is large, hard, and curved slightly downwards ending in a rather long spine, red in colour. On each side of the red dorsal stripe is a yellowish green one and outside that the whole surface is darker green and without markings even on the venter. On the lateral aspect of the somite carrying the first pair of prolegs and running its whole length is a dark red streak, horizontal, and pointed at each end. The legs are dark red, the prolegs green, and the spiracles are green.

Two larvae, not found near together, had a dark green dorsal stripe on the thorax and abdomen replacing the dark red one, but the head, the external aspect of the spinous processes, the distal half of the prothoracic spinous processes, the legs, the streak on the lateral aspect of the abdominal somite carrying the first pair of prolegs, and the tip of the anal spine were dark red as in the normal form of the larva.

Description of the Pupa

By C. N. HAWKINS.

A few days ago Dr. Cockayne very kindly sent me pupae of various species and amongst them were four examples of *Thalera fimbrialis* Scop. of which he asked me to give a brief description. Unfortunately the specimens are not in good condition, one (dehiscid, ♂) had been broken across the abdomen (possibly in the post) and the other three (dead, 2 ♂♂, 1 ♀) are more or less shrunk, mouldy and distorted and all have had their anal armature damaged. In the circumstances I am afraid the following description cannot be regarded as very reliable, at any rate as to measurements.

Superficially, the pupa in shape and markings appears rather similar to that of *Jodis lactearia* L. but of course is considerably larger. Excluding the cremastral spines (hooks) the total length would seem to be about 12 mm. in the ♂ and slightly more in the ♀; the greatest width is about 4 mm. at the fourth abdominal somite. The whole surface is finely rugose and the colour is buff with the maxillae, shafts of the antennae, tibiae of the 2nd pair of legs (which are small and narrow compared with those of the first pair), the interneural spaces on the wings, a line down the middle of the dorsum from the head to the 8th or 9th abdominal somite (faint on the forward half of the mesothorax), a row of more or less connected blotches along the line of the spiracles on each side, a spot on the front of the head between the bases

of the shafts of the antennae, the usual seta-bearing tubercles (which are rather prominent and bear curved buff coloured setae, one on each) and a double row of fairly large spots on the ventral surface of abdominal segments 5 to 8 at about the lines of the larval prolegs, black or very dark brown contrasting strongly with the general ground colour. The anal spike is rather long and slender with concave sides at the base and then tapering evenly to a blunt point; the dorsal surface of this spike is strongly rugose and the ventral surface bears a number of rugose ridges radiating outwards from the base towards the sides and end. The cremastral armature appears to consist of four pairs of fairly long and strong hooked spines, two pairs right on the blunt tip of the anal spike one pair dorsad of the other, another pair situate on the sides of the anal spike a little way forward of the two terminal pairs, and the fourth pair also situate on the sides of the spike about the same distance further forward. The anal spike is about $1\frac{1}{2}$ mm. in length and the cremastral spines are concentrated into about $\frac{1}{2}$ mm. at the extreme end.

Nola albula Schiff. at Chattenden

By H. C. HUGGINS.

In his most interesting article on the larva of *N. albula* in the *Record* (65: 247) Mr. Symes says that he does not know if the moth still survives at Chattenden Roughs, in North Kent. I regret to say that it does not, unless it has re-colonized the wood, and its old locality there is completely destroyed, although *albula* had been exterminated a dozen years before.

I first visited Chattenden in 1900. The woods were at that time preserved for sport and insects, more especially the latter, by the late Earl of Darnley (the famous cricketer, the Hon. Ivo Bligh). *N. albula* was already practically extinct; both it and *Siona lineata* Scop. (*dealbata* L.) were found only in an open plantation of ash-stools in the lower part of the wood, and I believe they had never been found elsewhere by collectors since collecting began there.

Lord Darnley and his predecessors kept this plantation in the proper condition for the moths by cutting out all poles directly they reached a height of twenty feet, and the stools were on an average thirty feet apart. The ground between was covered with long grass, dewberry, small dog-roses and many flowers, and being thus sheltered but open to sun and air was an ideal place for insects. In addition to *albula* and *lineata*, *Cybosia mesomella* L., *Parasemia plantaginis* L., *Diacrisia sannio* L., and *Lygephila pastinum* Tr. were there.

I was a young schoolboy at the time and was not allowed to stay late in July, when *albula* flew. In 1902 the keeper, Peek, showed me three larvae he had succeeded in finding for the present Lord Darnley (then Lord Clifton) who was making a small collection of moths found on the estate, and took me to the place and showed me how to look on the underside of small dewberry leaves near the ground. However, neither he nor I found any more and to the best of my knowledge no others were ever found there. Two of the three larvae were successfully bred and taken to Lord Clifton at Cobham Hall.

Peek told me these were the only larvae he had found since 1900, but he caught a moth in 1901 which his wife set (incidentally scratching

a big hole in one wing) which he gave me to console me as we found no larvae. I believe these were the only *albula* taken at Chattenden in the 20th Century. I still have mine as a curiosity.

During the 1914-1918 war the plantation was left to look after itself and when I visited it a few years later it was a thick wood with no undergrowth, quite unsuitable for any of the old insects.

I think it may be regarded as almost a certainty that *albula* colonises this country from abroad. I do not think it was found after it disappeared from Chattenden until the 'thirties. In the 'tens and 'twenties it was always referred to as extinct, and many of its present haunts are near the sea. It is most unlikely that a moth with a habit of flying to any light such as *albula* would have been overlooked for thirty years, particularly by men like Eustace Bankes, who lived in the centre of one group of its present localities.

I may mention that its curious localisation at Chattenden was mentioned to me by A. B. Farn, one of its earliest captors, who told me he never saw it outside the plantation.

Notes on Breeding *Euplagia quadripunctaria* Poda

By J. L. ATKINSON.

I obtained some five dozen larvae from two small batches of eggs laid by two females taken on ivy at Paignton, Devon, last year early in August (*Ent. Rec.* 1952. 64: 322). These eggs commenced hatching on 15th August, having been ten days in the egg stage. The larvae were placed in two glass-topped tins and fed on ivy, honeysuckle, groundsel and raspberry, and occasionally nettle. I kept the larvae indoors in these two tins until I left Paignton for Tankerton, Kent, in the first week of September.

At home I was able to give them more space and used small glass breeding-cages for some, with the foodplant in water, whilst the rest were still kept in the tins, about a dozen in each.

On the 19th December I had to return to Paignton again and was obliged to leave the larvae to look after themselves. At this time they had not gone into complete hibernation and were still feeding occasionally. The yellow-orange stripe on the back was now clearly in evidence in the larger larvae. I did not return to Tankerton until 10th March 1953 and I then found some 3 dozen larvae still alive with marked differences in sizes, some being half an inch long whilst others were not much more than a quarter of an inch. Those in the tins with much moisture from the decayed foodplant seemed to be the fittest. It seems evident that there had been some cannibalism as I could not find many dead larvae in the tins or cages. I transferred about half the larvae to growing foodplants (groundsel and raspberry in flowerpots) but continued to supply honeysuckle every few days.

On 10th April I again left for Paignton and returned on the 18th to find the larvae still doing very well although a few had died or escaped or been eaten by the others. The total remaining was now 30.

On 22nd May several started to spin up amongst moss and dead leaves at the base of the foodplant in the flowerpots and in the tins. The first pupa appeared at the end of May and by 12th June there were 26 in all, four larvae having failed to make the change.

The first imago, a female, emerged on 15th July, followed by three more ♀♀ the next day. By the 24th July 24 moths had emerged, the sexes being about equal. There were 4 crippled insects and one with three wings only, the right hind wing being entirely missing. One male was the form *lutescens*.

Of the 6 pupae which did not result in moths four were evidently about to do so as the colours of the wings were very clearly visible through the pupa-case. I put these failures down to the fact that the sun's rays penetrated to the cage and must have shone directly on these particular pupae.

I kept a series of ten for my cabinet and released the remainder on the honeysuckle in my garden, but I have little hopes of seeing any larvae there next year as there is no lush undergrowth beneath the honeysuckle, which is a very old bush (thirty years or more) at the edge of a lawn by a concrete path. Moreover, Tankerton is north of Lat. 51°, and on the Continent *E. quadripunctaria* does not quite reach that latitude.

An Entomologist in Argentina

II. Buenos Aires and La Rioja

By KENNETH J. HAYWARD, D.Sc.(Hon.), F.R.E.S.

After leaving the Chaco Santafecino of which a short account has been given in a previous issue, I spent about eighteen months in Buenos Aires, where my collecting was confined to occasional visits to the low-lying ground near the river at Palermo, a somewhat unsavoury area covered with squatters' shacks but where a little woodland and scrub-covered waste still remained, and to one or two excursions to a small strip of virgin forest at Punta Lara near La Plata or to the Delta islands at Tigre. Both the forest and the islands were interesting as they occasionally provided a surprise in the shape of some insect more properly associated with Misiones or south-eastern Brazil which had undoubtedly been brought south on the floating *camalote* or water hyacinth, large rafts of which in time of flood frequently break away from their original anchorage in some tranquil backwater and come drifting downstream, often transporting members of the smaller fauna, especially snakes. It was probably by this means that *Morpho catenarius argentinus* arrived at Punta Lara where it is now firmly established. the most austral home of any *Morpho*, a butterfly whose larvae live gregariously on *Inga uruguensis*, so resembling its red flowers that they may easily be overlooked.

Although my field work was restricted, I was able to attend the meetings of the Argentine Entomological Society that had been formed some three years previously and especially those friendly unofficial meetings that they held from time to time for conversation and exchange of insects. Thus I came to know intimately all of that small band of enthusiasts who in those days comprised the entomologists of Argentina, especially the brothers Breyer to whose friendship and unwavering support I was to owe so much in the years ahead, a friendship which eventually enabled me to throw off the thralldom of mechanics and devote my life to entomology.

When I had been about a year in Buenos Aires, Adolfo Breyer asked me if I would in my spare time look after his collection of beetles and also help him with his extensive archaeological collection of stone and pottery artefacts pertaining to the Indian civilisation of the time of the Diaguitas, a civilisation that perished about the middle of the seventeenth century when the Spanish conquistadores subjugated the Chalchaquí and Quilmes, the two last tribes to offer them resistance. A few months later he suggested that I give up my engineering job and go and live with him for a while on one of their country properties.

The Estancia Santa Rosa, better known as Guayapa from the Indian name of the locality where the main buildings were situated, was of about fifty thousand acres in extent and lay near Patquia on the western edge of the central plains of the province of La Rioja. Like all the surrounding country it was sandy, the monotony of its flatness being here and there relieved by low dunes and by the deeply eroded gullies and dry river beds gouged out of the soft soil by the run-off water from the torrential storms that now and again struck the district. The vegetation was mainly low xerophilous scrub, especially *jarilla* (*Larrea* spp.), with a great deal of mesquite and cactus and there were large areas of open forest where amongst the scattered trees the white quebracho predominated. In places the land was completely devoid of any vegetation, its surface sun-baked and cracked, whilst in a corner of the estancia there was a wide shallow depression containing a salt marsh with its typical flora of *Chenopodiaceae*, the ground covered with a thick layer of sodium chloride that looked like snow.

After rainfall the desert aspect would for a time change, the forest becoming green with the lush grasses whose seed had long lain dormant, and there would be a plethora of small flowering plants. In spring the scrub was brightened by the yellow flowers of mesquite, mimosa, retamo and *chañar* (*Gourliea spinosa*) and it was then that my bees worked overtime. Later came the flowers of the cacti whose exquisite beauty can only be fully realised when they are seen in their natural setting. To appreciate and know the flowering cacti one must live amongst them, for there are many whose blooms do not open till dusk has fallen and which fade with the first rays of the morning sun, and in many the flowering period lasts but two or three days after which they will not blossom for another year. These flowers always attracted great quantities of nitidulid beetles and, of course, small flies and I suspect that they were wooed by the larger hawkmoths though I never saw this happen.

On all sides our horizon was bounded by mountains, the nearby Colorados coppery red at dawn and sunset, the more distant ranges every shade of blue, their tiny well-watered valleys offering at that time a virgin field for the naturalist as many possess their individual micro-climate which influences their flora and the fauna.

Winter still had a month to run when we arrived at Patquia after a two-day journey from Buenos Aires, but though the nights were cold, the days were warm and sunny. Nowhere except in the African deserts have I ever experienced such absolute silence as reigned over Guayapa, not even the rustle of leaves broke the intense stillness, and often we heard clearly the noise of trains shunting in Patquia ten miles away. Eager as I was to start exploring, I had for a time to contain myself in patience since the estancia house had long lain empty and putting this and the garden in order kept us fully occupied till spring came.

The surrounding scrub was everywhere just a little too high to see over and as there were no paths, the only guides to direction were the sun and wind and an occasional glimpse of one or other of the scattered dunes or of the distant mountains. Consequently, it was all too easy to lose oneself, even within a few hundred yards of the estancia buildings, and until I came to know my way about it was no uncommon thing to find myself walking in exactly the opposite direction to that intended.

After the Chaco where there were such quantities of insects that one was sometimes embarrassed to know what to take and what to leave, the insect population of Guayapa seemed very poor, but representing a desert fauna it was no wit less interesting. One thing that drew my attention was the considerable colour variation that existed in some of the beetles, the dynastid *Phaneus imperator* being remarkable in this respect. It was here that I saw for the first time the larvae of the *Drilidae* which with their tiny headlights and lateral row of luminescent spots appear in the dark for all the world like tiny trains.

In those days the estancia had no electric light and the paraffin lamps on which we depended attracted few insects. Using this primitive illuminant I constructed a portable light trap but though I operated it for many months, and even carried it with me on several camping trips to other parts of the province, it was a complete failure, attracting nothing else but huge quantities of a small webworm moth whose larvae fed on the many coloured *Portulaca* with which the forest was in places carpeted. I tried at times most of the other recognised aids to collecting with equally poor results, though I did obtain a modicum of success with a trap of my own devising that was simply a small hole dug in the ground and filled with chopped green leaves and grasses, this material fermenting and proving attractive to a number of staphylinid beetles and certain *Apterygota* which could be separated by means of a Berlese funnel.

After moonlight nights insects were sometimes to be found settled on the whitewashed walls of the buildings and it was thus that I obtained the male of *Castnia lecerfi*. This was one of the two *Castnia* I encountered at Guayapa, the other being a species near *icarus endelechia* represented in my case by a pair of wings picked up near the salt marsh and its presence in the locality confirmed curiously enough some seven or eight years later by Mr. Alberto Breyer when he picked up a single wing in the desert near Patquia. Another occasional source of insects following moonlight nights was the big Australian water tank where we bathed in summer. Here I frequently found beetles floating on the water, having no doubt dived into it attracted by the glimmer of the moonlight on its surface.

At the time of which I write I had not yet begun to take any interest in the scale insects, this came later when I was engaged in agricultural entomology, but subsequent visits to Guayapa have shown that the area is rich in species endemic to the xerophilous regions of the country. I have probably collected as many different species of scale in Argentina as anyone else and if one excepts the agricultural pests that abound wherever man has taken his civilization, I have found some of the best places for collecting to be the drier parts of the country where the average collector would not think to look. Even

Suaeda divaricata, one of those curious salt-marsh plants known locally as *jumes* and a most unlikely looking host, harbours a small *Icerya*.

Scale insects provide a fascinating study for anyone who likes to roam about the countryside and has some knowledge of botany, but their classification is not always easy and requires the use of a high power microscope and certain proficiency in the preparation of the necessary slides. I have successfully solved the somewhat difficult problem of preserving for exhibition samples of scale-attacked leaves, twigs and bark, by the use of Riker mounts, $7\frac{1}{4}$ by 5 inches being a very convenient size (depth one inch). In these mounts the scale does not become separated from the plant and the preparations are very useful for study and handling by students. To get over the difficulty of mounting thick twigs I remove a certain amount of the underlying cotton wool from that part of the mount where the specimen will rest and if the twigs are very thick, they can be carefully split.

The Lepidoptera of La Rioja do not attract much attention. Many of the species are small and their colouring is subdued as befits a desert fauna, nor are they over plentiful. The larger butterflies show a tendency to dwarfing and except in the clouded yellow (*Colias lesbia*) where my smallest specimens have come from high mountain valleys, most of my "smallest ever" records are from La Rioja in those cases where the species in question flies in that province. I turned up only three new species during my stay at Guayapa; a tiny hesperid the first specimen of which I found floating in a water tank, afterwards locating its home amongst the grasses atop the dune that lay behind the houses; a common *Thecla* recently described and a pierid still without a name. The nymphalid *Mestra apicalis* sometimes appeared in fair numbers and I was able to take a fine series showing its extensive range of variation and I think it was perhaps commoner at Guayapa than I have ever found it elsewhere. Perhaps the most interesting butterflies, however, were the many species of *Hamearis*, a genus of the riodinids I have never plucked up enough courage to study. Some of these latter are not difficult to recognise, especially certain species from south-east Brazil, Uruguay and the Argentine mesopotamia, but in the more arid zones of this country from the Rio Negro valley right up to the Bolivian frontier there are a number so resembling each other and presenting such individual variation from locality to locality that it is not at all easy even to sort them into species.

It was whilst I was at Guayapa that I witnessed the first of the two great migrations of *Ascia monuste* that it has been my fortune to observe. This pierid may be seen migrating on a small scale almost every year but there are years when the flights assume almost incredible proportions and may continue for several months. Such has been the case this century during the summers of 1909-10 and 1930-31¹ and more recently during that of 1951-52², curiously enough at twenty-one year intervals, probably a mere coincidence. During the whole of the month of December and on into January these butterflies passed overhead in millions, dropping down to feed and rest in the late afternoons in such quantities that the grasses and even the more slender branches

¹See *Rev. Soc. ent. Arg.*, **3**: 225-232, 1931.

²See *Proc. "A", R. ent. Soc. Lond.*, **28**: 63-73, 1953.

of the tamarisks that lined our water channels were bowed beneath their weight.

Guayapa presented me with a riddle which is still unsolved. In a sandy corner of our garden there was a patch of *Ibicella lutea*, known locally as "cuerno del diablo" or the devil's horns, from the curious shape of its large seedpods. The pale creamy almost white larvae of a medium sized sphingid fed on the underside of the leaves of this plant as I have since found them feeding further north on the leaves of the closely allied *Craniolaria argentina*, another *Martyniaceae*, but though I have time and again attempted to rear them in captivity, every caterpillar has died before pupating, and this has been the experience of all who have tried to rear this moth. Is it that the leaves of these plants become toxic to the larvae after they have been cut and the sap has ceased to flow?

Even if my rambles round Guayapa produced few insects they were never for a moment dull. Although at first sight the country looked all alike, it was in reality quite varied as everywhere there were small areas where soil and vegetation differed, and even to the last I never went out without that feeling of anticipation that I experience when fishing in new waters. What added greatly to the interest of my walks was that in the soft sandy soil every creature left a message of its passing; the print of fox and skunk and hare; of rabbit or the wild guinea pigs and other smaller rodents; the pug marks of the puma; the tiny footprints of the armadillos between which lay the thin line graved by dragging tail; the tracks of the large rhea or of the many smaller birds or those left by passing snake. As a child learns first his alphabet and then to form his words, so I learnt first to recognise the makers of these signs and then to read the story that they told. Nor did I lack for shooting, for there were pigeon and *tinamou*, and in that wiley creature the Patagonian hare (*Dolichotis australis*) I found a worthy opponent.

The two years I spent at Guayapa were not in one long stretch but interrupted by a further spell of eight months in Buenos Aires, nor was all my time spent on the estancia itself as we often made short excursions or camping trips to other parts of the province which is a little larger in extent than Portugal.

One of our favourite camping sites was at a spot known as the Mogotes Colorados which was within easy riding distance of the estancia, an area of about sixty square miles where in comparatively recent geological time some great upheaval has left a maze of deep gorges whose containing cliffs of soft red rock tower skywards, of rocky hills and outcrops which, weatherworn, have taken on fantastic shapes. It was on the outskirts of this strange area where there was a little brackish water and some poor cultivation that I found the unnamed pierid, a *Hesperocharis* we have always mistaken for *lactea* which is a south Brazilian species.

My trips to the higher mountain valleys were not numerous but what insects they produced were always well worth while. One summer I spent a week at Los Corrales, a small estate lying at 7,500 feet back in the Nevado de Famatina (which rises to over 20,000 feet), and here I saw *Mathania* on the wing and caught new species of moths and beetles and, incidentally, worked for two days as a road navvy when a

sudden flood washed out the corniche road behind us. That same summer I passed some time at Chilecito, staying for several days in a shallow valley that at 4,500 feet runs back into the mountains behind the old smelting works at La Florencia. Here I was lucky in finding several acres of cultivated land that had been left fallow and invaded by flowering weeds that seemed to have attracted all the insects of the valley. It was whilst collecting over these flowers that I observed two cases of copulation between *Uremia bruchi* ♂ and *Rhonolophera bicolor* ♀ and the former of these beetles in copulation with a species of another family, a female of *Photinus fuscus*. It was in this valley, too, that I noticed for the first time the propensity of the hesperid *Nascus ocellatus* for dark caves, a peculiarity since amply confirmed by further observation and reports. I remember, also, how on my first day I spent long hours laboriously collecting six of the diaphanous *Episcada hymenaea*, a *Mechanitidae* I had not seen before, only to catch sixty in a single sweep of my net when early the next morning I found them playing midge-like in the shade of a great walnut tree.

But of all my excursions to the mountains, that which remains most graven on my memory is one we made to a spot called El Duraznillo in the Velascos a little to the north of the city of La Rioja. Here, turning over stones in a damp ravine I found insects in such quantity and variety that I could hardly believe that I was not exploring some forest in the tropics whilst all around I saw the yellow *Teriocolias riojana* whose male remains unknown¹. But it is no record of a great collecting that keeps green the memory of that day but rather a deep down rankling. It was a picnic and I had not taken even my smallest killing jar! For more than twenty years I have planned to return and, perhaps, some day I shall; stranger things have come to pass.

My stay at Guayapa ended suddenly. A telegram from the Ministry of Agriculture arrived one evening offering me the leadership of one of the expeditions then being formed to study the winter habits of the locust. It was only a temporary appointment but might prove the stepping stone to something better, so somewhat reluctantly I bade good-bye to the estancia and its easy-going open-air life. Little did I think as I looked back for the last time as the trees began to hide the houses how many times I was to return, to find in its tranquillity and peacefulness a place of rest when I sought to escape for a moment from the rush and burden of modern life.

¹I believe that *T. riojana* will eventually be found to be a dimorphic female of *setia* (Lucas).

Some Auction Sales of the 'Nineties

(Continued from page 287).

Willie Machin's collection was sold in February 1895. Machin had collected round about London for 58 years and was perhaps the best field lepidopterist of his day. By trade he was a compositor in a London printing-house; by nature he was a born observer with a flair

for animals. A skilful breeder of Lepidoptera, few men have accumulated so much knowledge of life histories. Tied to London by the long hours of his trade, he was never able to travel far afield, yet his knowledge was unsurpassed by any of his contemporaries. He was a quiet man who spoke little, and it was said that every word he spoke was worth listening to and every assertion that he made could be depended upon. Few men have been held in greater affection by their contemporaries. When he died (at the age of 72) Tutt accorded him a leading article in this magazine (*Ent. Rec.*, 5: 209) wherein he was described as "a kind-hearted genial friend, an upright and conscientious man, a keen and enthusiastic lepidopterist, an observant and diligent student of nature".

Machin's collection was a very fine one, "being especially rich in Tortrices and Tineina, and the whole are in the most perfect condition. It is one of those reliable collections, composed entirely of British species, which represent a labour of love spread over a man's whole life". An account of the sale will be found in vol. 6 of this magazine, pages 134 to 137. The macros realised about £370. But the prices fetched by aberrations of butterflies were low, a "grand female variety of *A. paphia*" making only £1 12s. 6d., another similar, two guineas.

Dr. F. D. Wheeler of Norwich, whose collection came up for sale in July, had collected chiefly in the Broads and Fens, consequently his collection was rich in fenland species. But as a whole his collection was disappointing, the condition of most of the specimens being described as "lamentably defective". Many showed signs of rough usage, possibly at the time of capture; the cabinets had been badly neglected for years: grease and mites had been "allowed to accumulate to a deplorable extent". Six *U. semiargus* from Evan John of Llantrisant sold for £2. Practically all prices ruled low. During the same month, among some oddments auctioned by Stevens were a nearly black *A. aglaia* taken in the New Forest by Gulliver, which sold for £6, and a similar specimen, taken by Harper the same year, which made £8 10s. Both these are probably at Tring. A fine streaked male *A. aglaia* was sold for £6 and a melanic *A. caja* for three guineas. J. E. Robson's collection of Geometrids and micros passed under the hammer in October. The condition of these specimens was poor and the prices were low, but two pairs of *P. lapponaria* fetched 40s. and 42s. In December Stevens disposed of W. H. Tugwell's collection—which incidentally contained "the only British specimen of *Syntomis phegea*". This redoubtable foreigner, said to have been caught by a Mr. Batchelor, fetched £3.!

Tugwell kept a chemist's shop in the City, later moving to Greenwich where he built up a prosperous business. But this necessitated close personal attention and except for an hour's fence and trunk searching every morning before breakfast he had little opportunity to collect. So he devoted his scanty spare time to rearing larvae from eggs sent him by his friends. Later he was able to work further afield and started to enrich his collection by buying specimens at Stevens', being a large buyer at the Howard Vaughan sale. But he bought and collected wisely: long series did not attract him; every specimen was carefully chosen, and he amassed a good many aberrations and local forms. He was, in fact, a good business man and saw

which way the trend of collecting was going. In 1873 he became President of the 'South London'. Under the hammer his large collection fetched good prices—the Howard Vaughan eleven *C. semiargus* had fetched only about 3s. each; now, in Tugwell's cabinets, two pairs made 35s. and 30s. The *L. dispar* were in fine condition, single specimens selling for £5, £6, and £7 7s. Bidding rose to 25s. for a *L. phlaeas* with one hindwing. A pair of *N. subrosea* brought £4. Prices were higher at this sale than at any previously recorded, the total realised being rather more than £460. Yes, Tugwell was a good man of business.

William Farren's collection, sold the same year, was also a large one and contained what was described as "the finest series of Fen forms sold at Stevens' auction-rooms for a long period". The butterflies were "practically given away". The fine series of *P. machaon* described by Farren in his long paper in this journal in 1893 (*Ent. Rec.*, 4: 100-108) sold for only £2 11s., a "fine asymmetrical var." of this species realising but 21s. Farren's series of *Cryphia muralis* var. *impar*, collected by himself from the walls in Cambridge, described by Tutt as "the choicest morsel in the collection" and to be "the finest in existence", sold in lots of four and five from 18s. to 45s. The Noctuids, however, realised comparatively high prices, especially the 'wainscots'. A series of *Perizoma sagittata*, containing an aberration in which the band was nearly obsolete, went up to £3 5s.

In March 1896 the collection of Clarence Fry came up for sale at Stevens'. It was contained in cabinets of 52, 20 and 12 drawers, the smallest one housing the Tortrices collected by three generations of the famous Standish family of 'professionals'. Joseph Standish, the first of whom we have seen any mention, was born in 1753 and lived to the ripe age of 84, dying in 1837 and collecting almost up to the day of his death. His son, the more famous Benjamin, was a shoemaker by trade and for sixty years used to trudge from Camberwell to Darenth and Black Park (Uxbridge) in search of insects. But by thrift, added to his success as a field lepidopterist, his honesty and his business acumen, he acquired sufficient house property to furnish his modest requirements and thereafter devoted his whole time to travelling about in search of Lepidoptera for his customers, collecting largely in the Fens. He was one of the great purveyors of *Lycaena dispar*. Standish believed himself to be the heir to a baronetcy and six estates in the north of England worth some £60,000 a year and was said to possess papers which indicated that he was the lineal descendant of two baronets of his name. Unfortunately for lovers of romance he never possessed the means to pursue his claims. Francis Oram Standish, his son (born 1832), accompanied him on many of his expeditions and died at Cheltenham in 1880. He was the discoverer of *Eupoecilia* (*Phalonia*) *gilvicomana*. Shortly before he died his collection was acquired by E. G. Meek.

Fry's sale realised £405 9s. 6d. It contained few aberrations but a good many rarities, and many of these were considered to be of such doubtful nationality that suspicion was cast on some that really were British. The 14 *L. dispar*—all from Standish—were very good and made £64 15s., the lowest price being £2 and the highest £6 15s. (a bred ♀). The mazarine Blues sold in pairs, from 14s. to 18s. per pair.

The "original specimen" of *Poecilopsis lapponaria* brought only £2 5s.—on its previous appearance in the auction-room (1884) it made £14. This large collection was typical of those formed by men who buy their rarities and the specimens fetched the prices which their confrères were themselves prepared to pay. The 52-drawer cabinet was knocked down for £14 3s. 6d. A small sale (J. A. Cooper) held the same spring was interesting for two series of *A. caja* aberrations, one series (which included a specimen with golden yellow hindwings and a fine melanic male) realising 37s. 6d., the other 21s. The *L. caenosa* were either not very good or not very credible, for they fetched only 5s. 6d. each. So also with the *T. cracca*, which were accompanied by 67 other insects and then made only 6s. But a veritable British *Hyloicus pinastri* "well authenticated" reached 32s. 6d. The 36-drawer Brady cabinet (and Brady's cabinets are probably the best that have ever been made) was knocked down for sixteen guineas. A 40-drawer Gurney reached £27 6s.

C. A. Briggs, whose collection came up at Stevens' in October 1896, was a solicitor practising in Lincoln's Inn Fields and living at Leatherhead. He was something of a 'character', a good raconteur with a fund of curious knowledge, therefore an agreeable companion. He never married and in his later years left Leatherhead and went to live, with a bachelor brother who was also a lepidopterist, at Lynmouth in North Devon. Here he turned his attention to other Orders, notably the Trichoptera, became a cryptogamist—by which we mean that he studied and collected mosses—busied himself with land shells, filled his house with antique furniture, and amassed some 2,000 pieces of rare china. As he had specialised, so far as the Lepidoptera were concerned, in aberrations, particularly those of the Lycaenidae, it is not surprising that his collection took nearly five days to sell and realised only five pounds short of £1,000.

An account of the more important aberrations was given by Tutt in this magazine (*Ent. Rec.*, 8: 272) and he prefaced his remarks with the words: "High as the prices ruled, there can be no doubt they would have been much higher had there not been so many forms precisely alike". It must have been a rich collection, indeed! The prices certainly were high, even though "several well known buyers . . . were notably absent". A male *A. cardamines* "with exceptionally pale orange tips" made £5, a ditto gynandromorph £4 10s., other aberrations of this species making from £4 10s. to £2 10s. These figures ruled for many other insects, but £5 was the highest attained (several times) until a bleached *M. jurtina* reached £7. A pale *A. caja*, the hindwings obsolete, went up to £12 2s. 6d. One of the 16 *L. dispar* made the record price of 8 guineas. Six gynandromorph *P. argus* ranged from 6s to 22s. per pair; other aberrant Blues fetched rather more, a *P. icarus* reaching £5. This was the first great sale of Lycaenid aberrations and the prices bid were in excess of anything previously attained.

The next important sale at Stevens' rooms, held in November 1897, was that of J. B. Hodgkinson, a Lancashire cotton-mill operative who lost the sight of one eye when a boy. We shall say nothing about him here, for he was the most noted lepidopterist of his age and a long chapter would be necessary to give even a résumé of his career. The

prices at this sale fell a good deal below those reached by the Briggs collection, though an aberration of *A. urticae* fetched £7 10s. But there were few butterfly aberrations and the rare moths did not command very good prices, the "historical Wharfedale" *Coscinia striata* (*Eulepia grammica*) making only 8s. *L. caenosa* fetched from 12s to 32s a pair. But a male *Leucodonta bicoloria* reached £4 5s. and a female, complete with pupa-case, five guineas. The highest price for *N. subrosea* was 50s. a pair. The total realised was £340 18s. 6d.

In April 1898 the collection of George Elisha was dispersed by Stevens. Of this collection Tutt remarked "It was probably one of the finest collections of Lepidoptera that had ever come under the hammer, both as to condition of specimens and the excellence of the setting. There were, however, no localities given and no attempt to name the various aberrations. The result of the sale, therefore, from the monetary point of view, must be considered most unsatisfactory, scarcely a single lot fetching anything like a fair or even moderate price". Two dark aberrations of *A. caja* and one with yellow hindwings (with 47 other specimens) made but 4s. 6d. A pair of *L. caenosa* 10s., two *N. conformis* 10s., and so on. Large lots of perfectly set Tineids, mostly bred, went for 4s. and 5s. per lot of 150 and 200. A 40-drawer cabinet produced only £15 and a 20-drawer one five guineas.

In December this year (1898) Richard South, editor of the *Entomologist*, sold all his collection other than Noctuids and Geometrids. The total realised, little more than £100, was surprisingly low; but the sale was not advertised: it does not seem even to have been announced, as many of the auction-room collectors "had no idea that the sale was about to take place". The Lycaenids in which South had specialised went for 4s. to 6s. per lot of 40 specimens. A 32-drawer cabinet sold for £16 16s. and a 30-drawer for 10 guineas. Which all goes to show that it pays to advertise.

The decade closed on 20th November 1899, with the sale of a small collection formed by Joseph Merrin of Gloucester, which the magazines did not deem worthy of notice.

Current Notes

At another page we print an interesting Note by Mr. W. H. Storey on the occurrence of *Lophopteryx cucullina* Schiff., the Maple Prominent, at Cambridge. For many years we have known that the larvae of this moth used to be had by searching the coppiced maples that grow in one of the woods on the Gog Magog hills; but Mr. Storey tells us that this locality seems to have been forgotten and that William Farren (who knew the Cambridge lepidopterous fauna if anybody did and who died only last summer) did not recall it when discussing *L. cucullina* a few years ago. Certainly the Gog Magog locality was known fifty years ago and may have been known long before that. Can any old Cambridge man who was 'up' in the 'nineties give any information about it?

In view of the pronounced northward movements of certain of our Lepidoptera during the last twenty-five years a Note by Mr. D. E.

Allen in the July number of *The Irish Naturalists' Journal* is of interest to entomologists. Headed "Botanical Indications of a possible climatic change in the Irish Sea area" Mr. Allen mentions a number of plants which "have recently shown a corresponding increase or decrease in the various regions bordering the Irish Sea. Thus *Anacamptis pyramidalis* L. (the Pyramidal Orchid) was . . . unknown in North-East Ireland prior to 1873 and has since spread all round the coast; it also appeared for the first time in the Isle of Man in 1923 . . ."

The Bee Orchid, also, which was apparently unknown in North-East Ireland till 1923, "seems to have begun to increase on the South Lancashire coast about 1920" and is now spreading all over the dunes, while Lyme Grass "which has been spreading on the Antrim coast since 1912" has recently appeared in Co. Down and is now found in the Isle of Man. *Lactuca muralis* is increasing in Ireland, while Goat's-beard (*Tragopogon pratensis*) is spreading northwards.

Mr. Allen asks "What is the explanation of these facts? It will be observed that the species which are spreading have, with the exception of *Elymus arenarius*, a south-eastern range in the British Isles—the two orchids, in fact, belong to Watson's Germanic Type. Most of the decreasing species, on the other hand, have a pronounced western range. This seems to be correlated with the fact that in the Isle of Man many bogs have been drying up of their own accord . . . The evidence seems to suggest a change to a less oceanic type of climate, permitting the infiltration of species of a more 'Continental' type".

On the mainland of Europe the westward movement of certain Lepidoptera of late years has been most marked. Among the species "on the move" may be mentioned *Lycaena virgaureae* L. (the 'Middle Copper' of the eighteenth century writers); *Polyommatus amandus* Schn., which has recently spread westwards from Sweden and the south Baltic lands into Denmark; *Dendrolimus pini* L. (the Pine Lappet of the old English authors), which until a generation ago was regarded as a rare moth in Denmark and has now increased considerably in that country—it is also moving north in France and now occurs little more than a hundred miles from our south coast; and *Panthea coenobita* Esper, a species formerly restricted to the pine forests of eastern Europe, which reached Hamburg in 1890 and appeared in Belgium in 1933. By 1949 it had spread to Denmark.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

Argyroproce penthinana Guen. The rediscovery of *Eustroma reticulata* Fab. leads me to hope that *A. penthinana*, which used to accompany it on the balsam, may also be taken again. Possibly it has already been found, but I have so far seen no record and heard no whisper that this has occurred.

Its larva was discovered by the late J. B. Hodgkinson in the dead stems of the balsam, and the northern collectors must have reared it

in considerable numbers as most of the old collections contained a full series. It should not be difficult to get by collecting the stems in November or December, but they must be kept out of doors till May or the hibernating larvae will dry up.

My friend Mr. J. W. Corder told me that when *penthinana* had disappeared from most of its localities, chiefly from destruction of the food-plant, a well-known collector went and swiped all the dead stems in the place where it still survived, bringing them away in suit-cases at a time. As he kept them indoors he bred only half a dozen, but, at any rate temporarily, he finished *penthinana*. This was just before the 1914-18 war and I have not heard of its capture since. Should it be rediscovered it is to be hoped it will be given a chance. Luckily it is a micro.

Hemimene alpinana Treits. The larva of this Tortrix is to be found in winter in the root-stocks of the moon-daisy (*Chrysanthemum leucanthemum* L.) and also in the big white cultivated kind in gardens. It is curious this moth was overlooked for so long, as it appears to be well distributed and in places abundant. It is very common in the Southend and Benfleet areas where the food-plant grows at all, and this year I found it most abundant in several places in the Burren, Co. Clare, in fact a nuisance as its numbers made it difficult to see if any rarer somewhat similar insects were about.

The genus *Metzneria* may now be found as larvae in the seed-heads they frequent. As they are obliging enough to spend the winter in the seed-heads it is not essential to take them in November; but their food-plants, being mostly conspicuous weeds, are apt to be destroyed. So it is as well to get them whilst the going is good.

M. lappella Linn. and *M. metzneriella* Staint. appear to be universal on burdock and lesser knapweed respectively, but I have not found *littorella* Douglas (plantain), *carlinella* Staint. (carline thistle) nor *neuropterella* Zell. (also a knapweed feeder) either common or well distributed. The larvae again do not pupate before April and must be kept out of doors till then.

Notes and Observations

DAPHNIS NERII LINN. IN BIRMINGHAM.—On 11th September 1953 I had the good fortune to take a specimen of *Daphnis nerii* whilst it was resting on the stem of a weed against the wall of an engineering works in Tyburn Road, Erdington, Birmingham. Though I took it with my hands it is only very slightly worn. The moth is a male and has a wing expanse of $4\frac{1}{2}$ inches.—J. BOOTH, 35 Farthing Lane, Sutton Coldfield, Warks. 16.ix.53.

DAPHNIS NERII LINN. IN DORSET.—A specimen of *D. nerii* was found at rest on a window-ledge of the King's Arms Hotel, Poole, at 12.15 p.m. on 13th September. This hotel is about 50 yards from Poole Quay, and on that day four vessels from foreign ports were lying alongside; one each from Leiden and Skutskar, and two from Antwerp. Weather was good but slightly cold. It is possible that the moth flew

to this country. or it could have been a passenger on one of these boats. It was captured by Mr. H. K. Jackson, who is an officer of H.M. Customs at Poole.—LEONARD TATCHELL, Swanage. 8.x.53.

DANAUS PLEXIPPUS L. SSP. ARCHIPPUS FAB. IN SOMERSET.—I thought you would be interested to hear of a record for the Milkweed butterfly (*Danaus plexippus*) this year. I had the good fortune to see one on a heather-clad moor near the village of Upton, Somerset, at about 3 o'clock in the afternoon of 1st August this year. When I first saw it, it was flying at a little over seven feet from the ground. It flapped its wings strongly for a little way, and then it glided. It had repeated this action several times before I caught up with it, but owing to the disconcerting flying habits of this species and the fact that I was 'armed' only with an unsuitable ring net, after several attempts at catching it, it outdistanced me. Then just as I had rejoined it again I tripped over a tussock of heather and when I picked myself up I could see no sign of it, and although I methodically searched that part of the moor in which I had last seen it for some time I never saw it again.

Its appearance on the wing, however, I shall never forget. Its unmistakably orange, black-veined wings showed very clearly, as did the white dots around the borders of the hind wings on the under side. These showed particularly well when the butterfly was performing the gliding action I have previously described. If this is the only record for this year, I would be interested to know, or if not I would be interested to hear the details of the other captures or sightings.—PAUL E. SMART, 69A Cleveland Road, South Woodford, London. E.18. 16.ix.53.

COENONYMPHA TULLIA MÜLLER IN LINCOLNSHIRE.—In the *Entomologist*, 1953, 86: 197, J. H. Duddington records the capture of several males on 14th June 1953 flying over a large tract of boggy heathland near Scunthorpe. This lies between the well-known locality near Doncaster in Yorkshire to the west and Glandford Brigg, now called Brigg, Lincolnshire, to the east, recorded by Morris in his *British Butterflies* (1853, pp. 48-9). It is interesting to know that *tullia* still exists in north Lincolnshire.—ED.

EUBLEMMA PARVA HUB. IN WILTSHIRE.—On 26th May 1953 a good male specimen of *Eublemma parva* came into an upstairs room lighted by a m.v. lamp. This house is about 14 miles west of Salisbury, with the Plain lying to the north and a high wooded ridge about two miles to the south. The valley of the Wylie runs east and west.—R. A. JACKSON, Codford St. Mary, Wiltshire. 18.ix.53.

CALOPHASIA LUNULA HUFN. LARVAE IN ESSEX.—I have to report that on 19th September last I took three full-grown larvae of *Calophasia lunula* Hufn. in South Essex. It was rather unfortunate I did not hear sooner of its presence in England this year as the locality in which the larvae occurred was the third I visited and had I reached it a week before I am satisfied from the condition of the food-plant I should have obtained several more. I was particularly struck by the superficial resemblance of the larva to that of *Pieris brassicae* L., al-

though its colours are brighter than those of the butterfly.—H. C. HUGGINS, 65 Eastwood Boulevard, Westcliffe-on-Sea. 29.ix.53.

CALOPHASIA LUNULA HUEN. IN KENT.—On 16th August 1951 I took a male of this species at light at Dungeness, and two more at the same place on 31st July 1952. Thinking that the insect might be breeding there, Mr. G. Law and I searched for larvae in the following September, and from the few we found we each bred a male and a female, mine emerging on 30th June and 3rd July of this year and Mr. Law's a few days earlier.

This year I found five nearly full-fed larvae at Dungeness, and I am informed that others have taken large numbers of larvae both there and at Eastbourne; so that the species seems to be well established in those localities.

Two further records should be mentioned. In September 1952 Mr. Law found a larva practically at his doorstep at Stone, Dartford, but it failed to pupate, and the toadflax on which it was feeding was promptly obliterated by the local Council. Also I had a worn male in my moth-trap here on 10th June of this year; but a search of likely-looking patches of toadflax in this district during the early autumn has failed to yield any larvae.

The pupa of *C. lunula* is remarkable in that the distal half of the proboscis sheath is free.—EDGAR J. HARE, Harrow Place, Pinden, Dartford, Kent.

LARVAE OF CALOPHASIA LUNULA HUEN. IN SUSSEX.—On learning that this newcomer to our shores had appeared in the larval state in some numbers, I travelled to Eastbourne on the afternoon of September 26, 1953, on one of the most lovely autumn days I can remember. En route I surveyed the coast from Seaford onwards in search of the foodplant, Yellow Toadflax, but little was forthcoming here or on the downs near Beachy Head. On joining Mr. R. E. Ellison at his house, he suggested visiting the Crumbles where he had noticed quite a lot of the Toadflax in bloom. We arrived soon after 3 p.m. It was like a summer's day. The first bunch of the foodplant we examined proved a blank. However, we then made our way westwards along the shingle when we noticed some small plants of Toadflax near a large ditch. In a moment I spotted a couple of the most striking black and yellow larvae sunning themselves on some grass nearby. A careful search revealed a number more, some feeding on quite short stems. A few were only half grown. After searching about on further pieces of toadflax we met a man who said he remembered a big patch among some bushes near one of the roads. This clump of high growing *Linaria* was covered with the larvae, feeding quite conspicuously. We finished up with a total bag of seventeen, all of which have now pupated, 5th October. They seemed to feed on all parts of the foodplant, flowers, seed and foliage, often stripping a whole stem of seed-pods, which is a good indication of their presence in the wild.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking 5.x.53.

CALOPHASIA LUNULA HUEN. LARVA IN KENT.—On 20th September Baron de Worms and I, at his suggestion, examined a growth of the yellow toadflax (*Linaria vulgaris* Mill.) in a locality in Kent, and about

noon I was lucky enough to find a larva of *C. lunula*, feeding openly on the seeds and flowers. It appears to be in its last instar. The ground colour is pale blue; there are yellow stripes on the sides and back, and two broken black stripes on the sides, with a thick sprinkling of black spots on the blue ground. The markings thus resemble those of a *Cucullia*, but the shape, tapering slightly towards head and tail, is like that of *Pieris brassicae* L. Altogether, a striking and beautiful object. So far as I know, it has not been seen in Britain before this year, but I understand that others have been taken in at least two places in the past fortnight. Despite considerable search both by day and after dark, Baron de Worms and I failed to find any more, though stems of the food-plant stripped of leaves and flowers suggested that several others had been at work.—R. F. BRETHERTON, Ottershaw, Surrey. 22.ix.53.

HELIOTHIS SCUTOSA SCHIFF. IN NORFOLK.—A good specimen of *Heliothis scutosa* was taken on 12th June last at Cockley Cley, Norfolk, and on 14th June I took one in my m.v. trap at Wells in the same county. A very worn one was taken at Hunstanton on or about the 16th. I hear that four more were caught near Norwich about the end of May, but I have no personal knowledge of these. All were taken in m.v. traps.—R. G. TODD, Wells, Norfolk. 23.ix.53.

LOPHOPTERYX CUCULLINA SCHIFF. AT CAMBRIDGE.—On 20th July 1946 Angus McCrae and Norman Holden, then at the Leys School, brought me a male specimen of the Maple Prominent which they had found on the herbage beside the Roman Road where it crosses the Gog Magog Hills not far from here. This capture was of special interest because the locality concerned is practically devoid of maple, the tree on which I believe the larva is usually found elsewhere. When I remarked upon this to the two boys they reminded me that there is instead plenty of sycamore, which South indicates as an alternative foodplant for the larva in captivity, and which might serve the insect in the wild state equally well.

So it turned out, for between the 27th August and the 21st September of that year McCrae, Holden and I beat twelve *L. cucullina* larvae from sycamore trees in the neighbourhood of the "Gogs". Five of these larvae were parasitised. The preferred feeding place seemed to be a cluster of saplings growing close to the base of a tree, when this condition was available. Otherwise several larvae were beaten from the lower branches which came within reach of our sticks. I found one more larva actually in my garden when gathering food plant for those already in captivity.

On the 13th June of the following year I found a male moth sitting on the upper side of a poplar leaf in Chesterton, on the eastern outskirts of Cambridge, in a garden well furnished with sycamore. Since then my opportunities for collecting have been regrettably few and far between. A female was disturbed from the curtains in my study towards the end of July 1949. It flew, with none of the dash one might expect of a "Prominent", through the open door into the hall before I could get my net and I noticed that it paid no heed to the two electric lamps it passed on the way. When sleeved outdoors it laid twenty-four eggs which produced moths in the following year. Two males came to the

m.v. lamp in my garden during the first week of July 1952. None has been attracted by the lamp this year but insects generally have been scarcer, due no doubt to the cold nights. A few days ago I spent an hour or two beating sycamore alongside the Roman Road and obtained three larvae from the shrubby growths which they appear to favour.

The "Victoria County History" gives two records for *L. cucullina* in Cambridgeshire; Fulbourne, a village close to the "Gogs", in 1886, and Fordham in 1924. That the insect is established in this part of the county seems clear; its range, however, has still to be ascertained.—W. H. STOREY, Fairstead, Long Road, Cambridge. 10.ix.1953.

CATOCALA NUPTA LINN. AND ENARGIA PALEACEA ESP. IN DERBYSHIRE.—My disappointment at failing to rear *Heliophobus anceps* this year has been somewhat relieved by the discovery in my light-trap on the evening of 26th. September of a perfect specimen of *Catocala nupta* L. It was so unexpected that I almost overlooked it! In a similar way I almost ignored a fine *Enargia paleacea* Esp. (*fulvago* Hb.) on 16th August. I thought it was ab. *flavescens* of *Cirrhia icteritia* Hufn. at first, but there was no doubt about the difference when they were placed side by side.—J. H. JOHNSON, 1 Berry Street, Hephthorne Lane, Chesterfield. 27.ix.53.

ACHERONTIA ATROPOS LINN. IN WEST SUFFOLK.—When staying at Felsham, a few miles south-east of Bury St. Edmunds, in the last half of September I had six pupae of *Acherontia atropos* Linn. brought to me, one from Felsham itself and the rest from the neighbouring village of Cockfield. Before my arrival four others had been found at Cockfield; all nine were in the same potato field.—F. H. LYON, Sampford Peverell, Tiverton, Devon. 8.x.53.

A LATE LITHOSIA QUADRA LINN.—While working my m.v. lamp on the coast near Mudeford on 21st August 1953 for *Euxoa tritici* L. I took a single male *Lithosia quadra* L. which I think may have been a migrant as I believe the date rather late for a resident and in addition the locality is some distance from the wooded area of the New Forest.—A. C. R. REDGRAVE, Hartsdown, Glenfield Avenue, Bitterne, Southampton. 17.ix.53.

EUSTROTIA UNCULA CLERCK IN YORKSHIRE.—Since I sent you my Note on this species (*Ent. Rec.*, 65: 295) I have met two entomologists who tell me that they found *Eustrotia uncula* commonly in 1953 in a locality five miles from the place where I found it, on the other side of Selby. The species appears to be extending its range every year and I do not think it likely to have been overlooked, since although a small insect it is unmistakable and can be taken by daylight.—S. M. JACKSON, 15 Westbourne Road, Selby, Yorks. 4.x.53.

DASYPOLIA TEMPLI THUNB. IN HERTFORDSHIRE.—I should like to record the capture of a specimen of this species in our mercury vapour light trap here last year on 23rd October. This is a very belated record but I have delayed mentioning it with the hope of taking another specimen of this insect which usually has a littoral distribution in the

south of England. Apparently this is the first inland record as well as being the first for S.E. England.—T. G. HOWARTH, Barnet Gate, Arkley, Herts. 10.x.53.

HERSE CONVULVULI LINN. IN HERTFORDSHIRE IN 1952.—I should like to record the capture and subsequent release of a very worn male of this species on the 30th August 1952 at our m.v. trap in the garden here.—T. G. HOWARTH, Barnet Gate, Arkley, Herts. 10.x.53.

EUPHYIA LUCTUATA SCHIFF. IN MID-SUSSEX.—On 14th June 1953 I captured a fresh male specimen of *Euphyia luctuata* Schf. in a wood in mid-Sussex. Recent captures of this species seem to indicate that it is a new arrival, already established in parts of Kent. If this is the case, my mid-Sussex record may be of interest and perhaps indicate that the moth is already extending its range from its early foothold. I hope more records from further afield will follow.

The specimen I captured was in excellent condition and was taken by day near the edge of the wood where oaks and young and old aspen predominated. The foodplant of this moth, *Epilobium* spp., was not only within the wood but also in large quantities outside the wood in an overgrown and rough field. This environment seems to correspond to its haunts in Kent. As time was limited a thorough search of all the ground could not be made and thus no more specimens could be obtained.—M. W. HARPER, Nedaich, Newtonmore, Inverness-shire. 18.viii.53.

IS EUPHYIA LUCTUATA SCHIFF. CONTINUOUSLY BROODED?—After several abortive attempts to obtain this species during August 1953 in the Ashford area, I visited another part of Kent where it had been taken. It was rather a forlorn hope since the date was 29th August. After circulating for some time among the willow-herb which was growing luxuriantly, I was about to leave when a small black and white moth flitted up and I had no difficulty in discerning it as my quarry. I retraced my steps and put up several more. It was 5 p.m. and very overcast. I was surprised to find my captures, mostly females, were in fresh condition as also were a few more taken two days later. Specimens had been taken in this locality at the beginning of June, at the end of July and in early August, so that my specimens would seem to be a third brood for the year. Eggs I obtained hatched on 6th September. The resulting larvae are just pupating now, 5th October. Will they produce yet a fourth brood?—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 5.x.53.

AN ATTEMPT TO REAR THE LARVA OF HELIOPHOBUS ANCEPS SCHIFF. (SAPONARIAE BORK., RETICULATA VILL.).—On 6th July last a specimen of *Heliophobus anceps* Schf. was found in a coalmine shaft near here. When it was brought to me it had laid about seventy eggs, all in separate straight lines about one inch in length. They had all hatched out by 19th July, but the young larvae rapidly disappeared, until by 30th August I had only one left. I provided them with a salad of plants including several species of *Polygonum*, *Rumex*, *Trifolium*, *Lotus*, *Lychnis* and *Silene*. I found that most species of *Polygonum* were nibbled, and the flowers of *Lotus corniculatus* L. were eaten, the rest were ignored. The single survivor reached a length of 20 mm.

and was a reddish brown colour on 1st September. It continued to eat the flowers of *Polygonum aviculare* L. and occasionally the leaves until 20th September when it ceased to move, became flaccid, and died. The larva was fond of resting on *Dactylis glomerata* L., but I saw no signs of feeding on this plant.—J. H. JOHNSON, 1 Berry Street, Hephthorne Lane, Chesterfield. 27.ix.53.

[The foodplant of this species in England remains (1953) a mystery. Hearing that Mr. Austin Richardson had taken the larvae in Ireland we wrote to him and he has kindly sent us the following:—"In early September 1936 I was digging under *Silene maritima* near Waterville, Co. Kerry, for larvae of *Hadena barrettii* and found in the soil two full-grown larvae unknown to me. They pupated almost immediately and I had next year two of the lovely rosy form which inhabits S.W. Ireland. I take the moth not infrequently here (Gloucestershire), very often flying over garden pinks, but have never found the larva".

Barrett (*Lep. Br. Is.*, 4: 153) asserts categorically that the larva feeds "on knotgrass (*Polygonum aviculare*), and doubtless other low plants. Abroad it is said to feed on *Silene inflata*, *Saponaria* and *Dianthus*, preferring the capsules; but Mr. Buckler was unable to induce his larvae to eat *Silene*. The suggestion of these plants indicates either a confusion or a singular unanimity of taste between this species and the somewhat similar species of the genus *Dianthea*. Unfortunately we know very little of this larva here".

Surely there must be some among our readers who have reared this insect successfully from the egg?—ED.]

SWARMING OF *ACENTROPUS NIVEUS* OLIVIER.—One evening this summer (unfortunately I did not record the date) I was surprised to find hundreds of *Acentropus niveus* Oliv. at the m.v. lamp in my garden. They swarmed on the sheet and congregated in masses in the hollows, fluttering over each other in great numbers. A considerable number were dead when I put the light out about midnight. B. P. Beirne (*Brit. Pyralid & Plume Moths*, 1952) refers to a "swarming period" for this species and remarks that the males may fly several miles from their breeding ground. It would seem that they must have come from some distance to my garden as I cannot find any really likely water close at hand. I would be grateful if any reader could give me more details of the "swarming".—A. C. R. REDGRAVE, Hartsdown, Glenfield Avenue, Southampton.

ABUNDANCE OF *PLUSIA GAMMA* L. IN HAMPSHIRE.—I have noticed the large number of *Plusia gamma* L. this Autumn. Just now it is the commonest species at the m.v. lamp and every evening recently I have seen specimens at the flowers in the garden, sometimes four and five flying at once. All appear to be in perfect condition.—A. C. R. REDGRAVE, Hartsdown, Glenfield Avenue, Bitterne, Southampton.

STERRHA SERIATA SCHRANK (*VIRGULARIA* HBN.) AB. *ATRA* KUHN AND VON ENGELHARDT.—This melanic form from Sicily, described and named in *Biol. Zentralbl.*, 1937, 57, 329-346, is genetically distinct from ab. *cubicularia* Peyer, which is found in England. It is a dominant determined by a single gene; the female is darker than the male; some of the darkest heterozygotes are as dark as a few of the lightest homozy-

gotes and an exceptional heterozygote may be as dark as the darkest homozygotes, but the majority of the latter are easily recognizable. The degree of melanism is influenced by the environment, being greater at a low temperature and high humidity and the larvae of the melanic form are more viable than those of the normal under these conditions. The name hidden in the middle of many pages of text has probably escaped the notice of British entomologists.—E. A. COCKAYNE.

ABUNDANCE OF LARVAE OF *EUPITHECIA MILLEFOLIATA* ROSSLER.—The larvae of this comparatively new 'pug' were very numerous in the Folkestone area on 4th October 1953. They were to be found quite conspicuously in the dead heads of the yarrow, nearly always in a clump of very thick growth. Most were full-fed, but some were still quite small. Mr. A. M. Morley, who has had much experience with this larva, says they come to the tops of the heads in the late afternoon. At other times they hide among the seed-heads and are often very difficult to spot.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 5.x.53.

CATOCALAS IN HAM STREET, KENT.—On 28th August 1953 I reached this well-known spot at dusk under very warm conditions. Insects were abundant at sugar. Among many common species I took two *Catocala sponsa*, one of which, a female, was quite fresh and later laid a number of eggs. Two nights later, on the 30th, I took the first *C. fraxini* of the season as well as a worn *C. promissa*. *C. nupta* was in great plenty: we saw as many as twenty on the patches in one night. I do not think any other locality could produce all four breeding species of *Catocala* and I wonder if anyone has seen them all together before in a single week-end.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 5.x.53.

A NOVEL WAY OF TAKING *CATOCALA FRAXINI* LINN.—On 18th September 1953 I sugared quite a large round in a well-known Kentish locality. I decided to finish in a spot well out in the open. As I sugared the last tree just as dusk was falling I was amazed when a huge moth fluttered to the ground. I at once realised I had brushed a *fraxini* at rest three feet from the ground. Not having a box or container handy I picked it up and put it in the loose pocket of my overcoat. It took me quite five minutes to get back to the car, where I deposited the moth in a large hat-box, brought for the purpose. Unfortunately close inspection later showed the insect to be a male which by that time had wrecked itself, so that my special efforts to preserve it alive were in vain.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking, Surrey. 21.ix.53.

EUPITHECIA INTRICATA ZETT. SSP. *ARCEUTHATA* FREYER IN HERTFORDSHIRE.—On 3rd June 1952 I found two large 'pugs' which I did not recognise on some fencing near Hadley Wood-Cockfosters, close to the Middlesex border. Later I showed them to Mr. A. L. Goodson at Tring, who identified them as rather large specimens of *Eupithecia intricata* ssp. *arceuthata*. The identity has been confirmed by Dr. E. A. Cockayne. I believe this species has not previously been recorded for Hertfordshire. There is no juniper near, but I believe there were

some species of conifers beyond the fence where I found the moths.—S. M. JACKSON, 15 Westbourne Road, Selby, Yorks. 4.x.53.

[This species feeds also on the Monterey Cypress, *Cupressus macrocarpa* Hart., which is not uncommon in gardens.—Ed.]

ORTHOSIA ADVENA SCHIFF. AND LEUCANIA VITELLINA HUB. IN HANTS.—It may be of interest to record the capture of *Orthosia advena* Schf. in my m.v. light trap on 25th April this year. This seems to be south of its normal range. I also took *Leucania vitellina* Hub. on 26th May. The colouring was paler than that of the normal autumn brood, the first of which appeared on 15th September. Presumably the May capture would be an immigrant.—B. C. BARTON, Castle Mead, Highcliffe, Hants. 26.ix.53.

NOTES FROM PURBECK.—On 28th August over Slepe Heath near Corfe Castle two ♂♂ *Colias croceus* in fresh condition were observed flying in a S.E. direction. The day was hot, with clear skies; temperature near 70°F. On 10th September the first *Herse convolvuli* appeared, and quite a few have been seen since. From 15th September *Vanessa atalanta* has been very abundant; also a fair number of *V. cardui*.—LEONARD TATCHELL, Rockleigh Cottage, Swanage. 22.ix.53.

NOTES FROM EAST ESSEX.—In common with other areas the present season has been rather disappointing for Lepidoptera, particularly migrants, though several species which had not been noted previously were captured by the light-trap. The first *Plusia gamma* was taken on 1st May; a second occurred on the 15th, and the species has missed only three nights since then. A male *Nycterosea obstipata* was found in the trap on 19th May. Later in the day the first *Vanessa atalanta* was seen, followed by *V. cardui* on the 21st; neither became common but three of each were seen on the 25th. The first *Nomophila noctuella* occurred on 23rd May, but only five have occurred since, singly.

Two good specimens of *Heliothis peltigera* appeared in June, on the 9th and 11th respectively, and a single male *Leucania albipuncta* on the 21st. A specimen of *Macroglossum stellatarum* was seen flying round the house on 28th June.

Plusia gamma increased considerably in number from 13th July, nearly 9,000 having been taken between then and 14th September.

The first *Colias croceus* was seen on 2nd August and a further six next day in lucerne fields near the sea. A male *C. hyale* was seen flying over lucerne on 15th August, the first time since September 1951. On the 19th, in East Kent and Thanet lucerne fields, 10 *C. hyale* of both sexes were seen to only three *C. croceus*.

On 21st August the light-trap produced 1,019 *P. gamma*, with a male *Herse convolvuli* and a pair of *L. albipuncta*.

On 27th August, in the Folkestone district, a further five *C. hyale* were seen in a lucerne field with only two *C. croceus*. Fifteen *V. atalanta* were also noted.

Seven more *L. albipuncta*, two males and five females, occurred between 30th August and 10th September, with a very fine large male *H. convolvuli* and 630 *P. gamma* on 9th September. A female *H. convolvuli* occurred with 498 *P. gamma* on 16th September.

Species recorded which seem unusual for the Essex coast were *Plusia pulchrina* on 23rd June; *Stauropus fagi*, a perfect male, 24th June;

Drymonia trimacula, several males, the first on 28th June; *Lygephila pastinum*, a male in good condition, 7th July; and *Simyra albovenosa*, three specimens, 31st July.—A. J. DEWICK, Curry Farm, Bradwell-on-Sea, Essex. 16.ix.53.

HIBERNATION OF PLUSIA FESTUCAE LINN.—In reply to An Old Moth-Hunter (*Ent. Rec.*: 65: 199) I have always looked upon *P. festucae* as a double-brooded species, emerging in June/July and again in August/September. The eggs from the autumn brood hatch quickly and the young larvae hibernate quite small, reappearing in April/May. They hibernate among the old leaves of *Sparganium*, *Iris* and *Carex*. In 1926 I caught a female in July near Wicken. She laid a batch of eggs which produced imagines towards the end of August. Two of these paired and their eggs hatched early in September. I put a plant of each *Sparganium* and *Iris* in a large pot and covered it with a 'sleeve' and stood it out in the garden. The sleeve was tied to a stick and also the pot to prevent it being knocked over. The young larvae hid themselves in folds of the leaves and if I remember correctly had spun themselves little pads of silk on which to sit. They reappeared in April/May and started feeding on the new growth. Almost all came through and I bred about two dozen imagines. The larvae seemed to prefer the *Iris*. In their natural state the young larvae must be able to stand severe flooding at times. I see no reason why late September pupae should not occasionally spend the winter as pupae instead of producing another brood.—H. M. EDELSTEN, Bramble Hill, Balcombe, Sussex. 22.ix.53.

HIBERNATION OF PLUSIA FESTUCAE L.—The recent notes on this species prompt me to record my experience of it in 1951, 1952 and 1953. The species does not appear to be common in this part of the country, but it is fairly widespread. It first came to my notice in 1951 when several specimens were taken in a garden at Romsey about the 8th September. I took it again at Farley Mount, near Winchester, on 9.vi.52 and again at Titchfield Haven on 19.vi.52. This year I took it at Titchfield Haven on 13th June and in my garden on 3rd September and at Hedge End, near Southampton, again on 8th September. Thus there was an autumn emergence in 1951 and 1953 and there could have been in 1952 since I stopped collecting after the first week in August because of the bad weather. This does not, of course, answer the question of hibernation, but at least it points to some regularity in the times of emergence when most of the text-books are at variance with each other.—A. C. R. REDGRAVE, Hartsdown, Glenfield Avenue, Bitterne, Southampton. 17.ix.53.

DIURNAL SYNCHRONY IN HATCHING OF EGGS.—A brood of some 200 *Amphipyra tragopoginis* Clerck hatched from the egg with such precision as regards time of day that it may be worth recording if only to encourage other breeders of Lepidoptera to notice if other species have a fixed daily time of emergence. The brood commenced to hatch on 12th April, a few at a time, but it was not until the third or fourth day that I noticed none hatched in the afternoon. I then paid more attention and found that the hatching period was incredibly exact, from 10 a.m.

until 11.30 a.m., and on only one occasion did a larva hatch earlier and that by only half an hour, namely 9.30 a.m. The brood took fifteen days to complete emergence, had been in the egg stage for seven months, and yet hatched at what must be a specially fixed time.—A. L. GOODSON, 26 Park Road, Tring.

VANESSA ANTIOPA LINN. IN BUCKINGHAMSHIRE.—In *The Field* of 24th September Mr. J. J. Sawson reports that "this very fine butterfly made one of its uncertain periodical appearances on Saturday, September 5th, in a garden in the village of Edlesborough, Buckinghamshire. It was seen resting on an apple tree, where it stayed for several minutes, giving ample time for examination".—ED.

A HINT ON PRESERVING LARVAE.—I have seen several descriptions of the way to 'blow' lepidopterous larvae but I don't remember having seen in any of them the recommendation to starve a larva for 24 hours or more before blowing it. By this period of starvation the first part of the gut is emptied and the risk of breaking it and leaving food inside or even outside it is avoided. Food in the thorax is especially unsightly in the paler and more transparent species.—E. A. COCKAYNE, Tring. 10.x.53.

Collecting Notes

COLLECTING NOTES IN 1953.—*Euphyia luctuata*: I took five specimens of this species between 2nd and 6th June in the woods near Ham Street, Kent. Three were flushed by day and two came to m.v. traps. All were in perfect condition.

Plusia ni: Two ♂♂ came to m.v. traps on the night of 14th August on the beach at Torcross, Devon. Another arrived on the 16th and a fourth on the 17th. The two traps were placed in identical positions on the same shingle bar the same distance from the sea, one a quarter of a mile north of the other. On the night of 8th August well over 1,000 *P. gamma* were in the traps, by far and away the majority being in the trap nearest Start Point (to the South). On the 14th there were about 500 *P. gamma* and once again the majority were in the more southerly trap. On each occasion they left almost immediately and on the 17th, a reasonably good night, I counted only 8. I think, therefore, that this was a primary migration.

Other Devon records: Two *Heliothis peltigera* came to m.v. traps on 8th August and one on the 16th, on which night I also took four *Nomophila noctuella*. *Macroglossum stellatarum* came to m.v. on the 15th and one *Peridroma saucia* (*porphyrea* Schiff.) on the 11th. *Euplagia quadripunctaria* was fairly common by day but on no occasion came to the m.v. traps. The larvae of *Hadena barrettii* were extremely common this year.

Of butterflies, one ♂ *Colias croceus* was caught on 16th August, on which date also a ♀ *Argynnis euphrosyne* was taken by my son.—H. B. D. KETTLEWELL, University Museum, Oxford. 8.x.53.

A NIGHT AT PORTLAND WITH THE M.V. LAMP.—On 29th September 1951 I went with a friend to Portland and among other insects took three specimens of *Leucania l-album* L., two at ivy-blossom and one at

sugar. That night was not altogether favourable, there was a strong wind and clear sky and it was cold. The opportunity to revisit the Island came on 26th September this year. On this occasion the weather was much more favourable and although the sky was clear there was no wind and the temperature was high for the time of year; in addition this time I took with me a portable m.v. outfit. My friend and I arrived at our chosen spot, on the edge of the cliffs, near a dis-used stone quarry not far from Church Ope Cove at about 6.30 p.m. Two lights were used, an 80-watt at the top of the cliff and a 125-watt in a sheltered hollow abounding with ivy bloom about half-way down the cliff side. We expected that this second lamp would provide us with the majority of our insects. The lamps were switched on at 7 p.m. and while I kept watch on the lower lamp my companion stationed himself at the ivy bloom out of range of the light, and about half an hour later he took the first two specimens of *l-album*. At the lower lamp the first moth to appear was *Plusia gamma* L. but this was quickly followed by a further three *l-album*. By this time it was quite dark and my friend had moved up the cliff to the top lamp where *gamma* and *Phlogophora meticulosa* L. were appearing in numbers together with an occasional *l-album*. It soon became apparent that the lower lamp was attracting very little while the top one was bringing in plenty.

By 9 o'clock some 12 or 15 *l-album* had been taken, together with a number of *Antitype flavicincta* Schf. and *Aporophyla australis* Bdv. There was then a distinct lull until about 10 o'clock, even *gamma* and *meticulosa* ceased to arrive. Things became livelier and during the next two and a half hours reasonable series of the three insects were taken. After 1 a.m. *Eumichtis lichenea* Hb. began to appear in small numbers and although in general there was a marked falling off in numbers, *l-album* and *australis* continued to arrive at intervals, but no more *flavicincta* were seen.

We were surprised to see only a few *Leucochlaena hispidula* Geyer, as in 1951 this was quite the most abundant of the more desirable species. A petrol lamp put down then on the grass immediately attracted about 20 specimens (all males).

Among the other species noted up to 2 a.m. when we shut down the generator were *Aporophyla nigra* Haw. (commonly), *Omphaloscelis lunosa* Haw. (few), *Triphaena comes* Hb. (a few in rubbed condition) and a perfect *T. pronuba* L., two *Rhyacia simulans* Hufn. and two *Scopula marginepunctata* Goze one of which was of the Portland form with a ground colour almost that of freshly-quarried Portland stone with very clear markings.—A. C. R. REDGRAVE, Hartsdown, Glenfield Avenue, Bitterne, Southampton. 4.x.53.

DIPTERA

VOLUCELLA ZONARIA PODA IN MIDDLESEX.—This afternoon, 7th September, I caught a specimen of this fine Syrphid in my garden at Wembley. It was feeding at the flower of a *Sedum spectabile*. Mr. L. Parmenter, who has seen it, has kindly confirmed the identity. It is a female.—I. R. H. ALLAN, 33 West Hill, Wembley Park, Middlesex. 7.ix.53.

COLEOPTERA

Beetles in Epping Forest

By F. A. HUNTER, B.A., F.R.E.S.

I visited Epping Forest for the first time in June this year, and during a stay of two weeks at Chingford I came across a number of interesting beetles. The preponderance among the trees of *Carpinus* and *Fagus* was notable, and most of the beetles recorded were taken in the dead and decaying stumps of these trees.

One large fallen beech log on examination provided an interesting ecological study in the succession of beetles inhabiting fallen logs. The bole of the trunk was rotted, and contained only small Elaterid larvae and woodlice. Further up the trunk the galleries of *Dorcus parallelipedus* (L.) were very much in evidence, and here also I found a male adult of the large Elaterid *Athous villosus* (Geoff.). In the sound wood towards the top of the trunk I found larvae, pupae, and adults in their galleries of the local Longicorn beetle *Leptura scutellata* Fab.

I was both surprised and pleased to find, just under the sapwood in the upper part of the trunk, a small colony of adults of the rare Serropalpid *Phloiotrya rufipes* (Gyll.). Previously I had seen this beetle only singly in the New Forest, Hampshire. I was fortunate enough to take twelve adults and a pupa from this colony. These were lying in their pupal cells, with their heads towards the outside. Unfortunately, the pupa had changed into an adult before I decided to preserve it, so that I now have no pupal specimen.

In the hornbeam stumps I examined I discovered the following more important species:—

Under bark: *Melandrya caraboides* (L.) adults; *Rhagium bifasciatum* Fab. larvae; *Anaclyptus mysticus* (L.) adult; *Athous villosus* (Geoff.) pupa.

In wood: *Leptura scutellata* Fab. larvae, pupae, adults.

Other interesting species noted on bramble flowers, etc., were:—*Clytus arietis* (L.), *Grammoptera ruficornis* (Fab.), *Melandrya caraboides* (L.), *Rhagium mordax* (Deg.), *Strangalia melanura* (L.), *Chrysomela populi* L., *Onthophagus vacca* (L.), *Sinodendron cylindricum* (L.), *Lucanus cervus* (L.), and *Dorcus parallelipedus* (L.).

I was amazed at the frequency of *Leptura scutellata* Fab., which seemed here to be much commoner even than in the New Forest.

CETONIA AURATA L. IN BOURNEMOUTH.—On 7th April this year I saw a very early specimen of this chafer, as reported in the *Record*, 65: 185. On 5th September I saw one fly to a Buddleia in my garden and alight on a flower spike. I gather from Mr. A. A. Allen's note that this is an unusually late date for this insect. Strangely enough, I have not seen more than one or two specimens between these two dates.—H. SYMES, 52 Lowther Road, Bournemouth. 22.ix.53.

Fifty Years Ago

(From *The Entomologist's Record* of 1903).

DRYMONIA CHAONIA IN KEW GARDENS.—It is not often that I get the chance of observing an insect nowadays, but I happened to-day

in Kew Gardens to see a specimen of *Drymonia chaonia* which fluttered down to my feet. It seems rather an urban locality for it, and I suspect on this account it is interesting enough to make a note of. My last urban insect of interest under somewhat similar conditions was *Cyaniris argiolus*, which was sitting on the pavement near St. John's Wood Road Station.—W. F. H. BLANDFORD.

THE 'C' IN *POLYGONIA C-ALBUM* L.—Professor E. B. Poulton showed a specimen of *Polygonia c-album* in the attitude of prolonged repose He said that probably the 'C' or 'comma' on the undersurface of the hindwings in butterflies belonging to the genus *Polygonia* represents, in bright, strongly-reflecting 'body-colour', the light shining through a semi-circular rent in a fragment of dead leaf, the rent produced when a little segment of leaf has broken away along a curved line, but still remains connected with the rest across the chord of the arc. Unless such a segment remains precisely in the plane of the leaf—or even then when shrinkage has taken place—light may pass through a curved and often a semi-circular slit-like window. Such curved cracks, probably produced by alternate wetting and drying, are very common in dead leaves.

PARASEMIA PLANTAGINIS L. IN THE ALPS.—On some of the high flower-covered alps it occurs in boundless profusion and in marvellous variety. The variation from the blackest to the whitest examples is most extreme. Above Arolla, at an elevation of from 7,000 ft. to 7,500 ft. I found the species between August 1st and 13th, 1903, in the greatest profusion on the alps above the higher chalets towards the Pas du Chèvres, which at this time were huge beds of blue, and yellow, and white, due to the magnificent masses of bloom of forget-me-nots, gentians, hieracii, saxifrages, etc., with which the upland alps were covered. . . . It is impossible to guess at the abundance of this species on these slopes. There must have been literally millions. . . . The attempt to capture the swift-flying males on steep slippery slopes is not at all bad sport, and where the ground is at all bad, rather difficult and dangerous as well. I had one or two nasty falls whilst thus engaged, but this did not prevent me from keeping to the work until a very fair series had been collected.—J. W. TUTT.

Current Literature

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS. Vol. X, Part 1. DIPTERA. SYRPHIDAE. By R. L. Coe. Published by the R. Ent. Soc. Lond. 1953. Price 17s. 6d.

Mr. Coe's volume will be welcome to dipterists as apart from the excellent but necessarily brief summaries in Chapter XII of Colyer and Hammond's *Flies of the British Isles* no comprehensive work on the British Syrphidae has been published since Vol. 8 of Verrall's *British Flies* in 1901. It deals with 234 species compared with "about 200" in Verrall and after some brief introductory remarks on general characters, life-histories, etc., there follow the keys to sub-families, genera and species. There is a bibliography and an Index. There are no detailed descriptions of individual species and one misses

the valuable comparisons with closely allied species which are such a useful feature of Verrall's work. However, to have included these would have made the book considerably longer and probably more expensive. Each genus has a brief descriptive introduction including what is known of the life-histories of its species. The specific descriptions in the keys are concise and, so far as the writer can judge, adequate. Distribution is given but definite localities only in the case of rare species. The month of appearance is stated.

There are 49 outline text figures. In the reviewer's opinion those of head-profiles and tops of heads are not too easy to use unless one has most of the species illustrated for comparison; and the figures of the legs of *Platychirus* and *Xyleta* would be improved by the addition of their characteristic hairs and spines. The figures of antennae and wing-venation are excellent. As to nomenclature, the author has made the best of both worlds by keeping to the old well-known generic names in most cases and at the same time giving the "modernist" names in brackets. This is a most useful, compact, and up-to-date work on one of the best known and most popular families of Diptera, and its relatively low price puts it in reach of most purses.

H. W. A.

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS: COLEOPTERA.

Published by the Royal Entomological Society of London. 1953.

Vol. V, Part 7: COCCINELLIDAE & SPHINDIDAE. By R. D. Pope. 12 pp., 23 figs. Price 2s. 6d.

The Sphindidae are treated as including *Aspidiphorus*, which arrangement is likely to be generally adopted; but the family is not here characterised. All but two species, therefore, dealt with in this part are Coccinellids. Though many of these beetles (the familiar 'Ladybirds' and their allies) are tolerably well known and have a conspicuous colour-pattern, the extreme variability to which the latter is often subject, and the fact that generic and specific criteria equally often rest upon somewhat obscure or slight differences of underside anatomy, render the construction of a simple yet reliable key no easy task. The author has to a large extent overcome this difficulty, with the help of economical illustrations, and we believe his keys to be a distinct improvement on previous English ones. The present family has suffered from the activities of taxonomic hair-splitters and it is doubtful whether some of the genera created by Mulsant, Weise *et al.* are of more than subgeneric value; the dismemberment of the old genus *Scymnus* (justifiable, perhaps, from the specialist standpoint) seems rather to complicate than simplify matters for the ordinary student. Mr. Pope has rightly not attempted to list the innumerable named aberrations, which would only have overburdened a work of this scope, but refers to the literature on them and notes for each species the general range of colour-pattern. Indications relating to occurrence are sufficient in some cases, but this has hardly been carried through consistently. Thus, the connection of several species with fir trees is stated, but it might have been extended to *Harmonia* (p. 6) and *Myrrha* (p. 7), if not also to *Nephus 4-maculatus* (p. 9); and the apparent restriction of the first to a few south-eastern localities and of *Coccinella 5-punctata* (p. 10) to the north and the south-west could well have been

noted. Frequency is seldom mentioned; there is nothing to show that *Adalia conglomerata* v. *bothnica*—British on one specimen—is any rarer than the ubiquitous *A. bipunctata* with which it is contrasted (p. 11), or that *Vibidia 12-guttata* (p. 6) is not known to have occurred with us for over a century. On p. 8 the habitat of both *Pullus suturalis* and *P. limbatus* is given as 'Usually in marshy places'; this should be 'On fir trees' and 'On willows or sallows' respectively (cf. of the reviewer's note in *Ent. mon. Mag.*, now in the press). *Calvia 10-guttata* L., added to our list in 1928 (*ibid.*, 64: 104) from Ireland, is omitted—seemingly by accident. The 'palely testaceous' spots (p. 8) of *Chilocorus renipustulatus* are a full blood-red in life; and the 'yellow' of *Adalia bipunctata* ought surely to be 'red' as regards the elytra, at least in the two commonest forms which might with advantage have been briefly noticed here. '*Sycmnus*' (p. 4) should, of course, be '*Scymnus*'. Changes of name are few and unimportant.

A. A. A.

AMATEUR ENTOMOLOGIST LEAFLETS. (Reprinted from *The Amateur Entomologist* and *The A.E.S. Bulletin*).

No. 9. Collecting Caddises, by W. Whitehead, 5 pp. 4 Plates, 1/-.

No. 22. Collecting Lacewings, by Lt.-Col. F. C. Fraser, 9 pp., 5 Plates, 1/-.

No. 25. Collecting Bumble Bees, by T. B. Poole, 20 + ii pp., 2/-.

No. 26. Collecting Collembola, by P. R. Barratt, 6 pp. 1/-.

(All obtainable from The Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. Postage 1½d.)

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To varying degrees the leaflets listed above provide that guidance and, in answering these questions, encourage the beginner to pursue his studies along the right lines. The fact that the Leaflets are Reprints occasionally leads to anomalies which do not help the reader. For instance in No. 9 reference is made to Plates IX, X, XI and XII which, presumably, are those actually numbered I to IV, and in No. 26 no reference is given wherein Dr. Salmon's mounting method may be found.

Leaflet No. 25 on the Bumble Bees is particularly good and the excellent identification key and drawings should enable even the veriest tyro to run his bees to earth without difficulty.

The photographs vary considerably in their use to a beginner and in some cases the space could better have been used with drawings of apparatus.

I. R. H. A.

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Wanted.—Volume LVI (1944) of *The Entomologist's Record* (unbound).—H. W. Andrews, Spring Cottage, Smugglers' Lane, Highcliffe, Christchurch, Hants.

Wanted.—Volume XV (1903) of *The Entomologist's Record*, in parts as issued. £1 offered.—F. W. Byers, 59 Gurney Court Road, St Albans, Herts.

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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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TO OUR CONTRIBUTORS

All material for the magazine should be sent to the *Assistant Editor*
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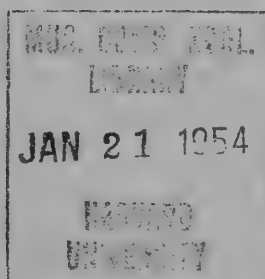
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AND JOURNAL OF VARIATION

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EDITED BY

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Editorial

At the completion of the first volume of this magazine in March 1891 Tutt wrote: "The general tendency of a large number of readers to require a complete index for scientific reference has led us to compile a complete 'Special Index', containing every reference in the Magazine. This will be published separately, price 1s, and we trust that our subscribers will buy this, so that no loss may fall on our enterprising proprietor". This first Special Index comprised 24 pages, and its format and arrangement have been followed in each succeeding volume up to last year.

Henceforward we shall have to revert to the practice adopted by our Founder: it is no longer possible to supply the Special Index free of charge. For financial reasons it has never been possible to entrust its compilation to a paid indexer, and although it entails considerable labour and occupies many hours which an entomologist could spend more profitably, willing helpers have never been lacking. There is no difficulty on that score. But it is now a costly thing to produce. If the economic price of the 24-page Index of 1891 was 1s, it would be at least 4s to-day. Even the present-day 16-page Index is too heavy a burden for the magazine to bear in its present size. We believe it would be contrary to the wishes of our subscribers to reduce the number of pages of each issue in order to supply the Special Index free of charge.

So we must return to the original practice of making a charge for the Special Index. That charge will be 2s. Will those of our subscribers therefore who wish to receive the Special Index for 1953 please add this amount to their remittances when renewing their annual subscriptions?

An Isolated Fauna

By MALCOLM BURR, D.Sc.

In *The Entomologist's Record* of 1945, Plate I shows a fine view along the Bosphorus, with the grim castle of Rumeli Hisari, which is a prominent landmark for miles. It was built in the year 1452 by Mehmet II, the Ottoman Sultan who captured Constantinople in the following year. The prominent feature in the photograph is the notorious Kara Kula, the Black Tower, with all its dungeons. The actual builder was Sarudja Pasha, one of the Sultan's generals. It is 28 metres in height and the diameter is 23.80 metres. The thickness of the walls varies from 3.5 to 7 m., and near the top, on the inside, there is a passage into the interior of the wall, at the end of which is an opening into a pit some 3-4 m. deep, in the middle of the masonry. Unwanted prisoners were pushed into the passage and along it until they fell into this dry well, to be forgotten. That is why it is called an *oubliette*, one of the two perfect specimens still existing in Europe, I believe. I looked down into it with a torch, but could see no grisly remains.

At the top, on the outside, there is a central turret around which, bounded with battlements, is a circular path about three metres in

width. On this there is an accumulation of soil which provides a home for a tolerably rich fauna and flora, which is interesting because it started from scratch and has been isolated for 500 years; so it must have been populated by wind or by bird transport in the case of plants and by flight or crawling by insects. Also, both may have been brought in by human beings, most probably unconsciously, on their clothing, boots or food. The tower is kept locked, but the key is available and occasionally an enterprising visitor may bring some refreshment with him and scatter some seeds, which would account for the little fig trees, or some seeds or eggs attached to the mud on his boots. But how could the myrmecophiles have found their way there?

On two occasions I have been up to the top, both times accompanied by Professor Kosswig, once in May and once in October.

The first thing to greet us as we entered the gloomy portals was a flutter of bats. I made a sweep at one with my net, but his radar was too good and he evaded it. They were big fellows, very likely the serotine. In one of the guard chambers on the way up there are some old bins, where I suppose the men kept their corn for bread-making. In these were the remains of faeces suggestive of rats or mice, dried up, but of unknown age. So we started with at least two mammals on our list!

When we got to the top I had a good hunt below the stones and rubble on the patch of earth. Here were nests of ants (*Tetramorium*). Among them we found a *Lepisma* or, according to Kosswig, probably an *Atelura*, and I dare say a prolonged search would reveal other *Thysanura*. Of *Collembola* there were tiny white ones in the ants' nests, which Kosswig suggested are *Nicholetia*. Now how did they and the ants get up there? Even if flying queens settled up on that isolated top how did they get their guests?

Of *Rhynchota* there were only some small white *Cercopid* larvae on the plants, and of *Coleoptera* surprisingly few. We found some *Tenebrionidae* and numerous specimens of a small black beetle, not identified. I note that Donisthorpe agreed with Father Wasman's view that the association of the former beetle with ants is not a chance one and that they show a marked tendency to be, or to become, myrmecophilous. Their occurrence up there in association with the ants strengthens this view.

Lepidoptera were not much in evidence. I saw only a small green caterpillar and a few small pale *Crambus* in the grass. Rather surprising was the presence of *Loboptera decipiens*, an apterous cockroach that is common in Southern Europe. How did he get up there? Twenty-eight metres up a vertical wall is a stiff climb. Just as surprising was a single larva of a small green bush cricket, *Poecilimon bosphoricus*, that is abundant in the herbage at the foot of the tower. It is an apterous genus, sluggish in habits, related to our British *Leptophyes punctatissima* and it is difficult to see how it found its way up.

There were several representatives of other groups of *Arthropoda*. A small brown spider with a long abdomen that looked familiar enough and two species of woodlouse that Kosswig named for me, *Armadillium granulatum*, very common under stones, and *A. vulgare*, which we found only on the second visit. It is exceedingly common in the neighbour-

hood. Characteristic with the ants was *Platyarthrus hoffmanseggii*, which Donisthorpe identified for me some years ago. It is associated with almost all European ants, he told me, yet we wonder how it found its way up there. Verhoeff has discriminated three species of this genus among material sent him from this neighbourhood by Professor Kosswig, so possibly this may turn out to belong to one of the new ones. There was also plenty of a small red mite, and an Acarine among the ants was clearly a myrmecophile, associated with *Tetramorium*. Another Arthropod was the Myriapod *Pachyjulius flavipes*, common under stones, often in clusters. Did they crawl up those high walls? Or were they brought up attached to some human boot? Finally, Kosswig saw, but did not catch, a *Scutigera*.

Outside our scope, it is worth mentioning the birds, though not actually on the tower but flying around and perhaps settling there from time to time. There were the common and the alpine swift, plenty of jackdaws and rock doves, some lesser kestrel and a peregrine that flew round and round, shrieking at our intrusion, so perhaps she had a vested interest in the building. There were also several lizards on the top, which must have been enterprising fellows, or descendants of enterprising parents. Kosswig told me that they are the colour variety *olivacea* of *Lacerta sicula hieroglyphica*. Finally, there were a few Mollusca, which probably climbed up the walls, several small *Helix*, and plenty of a small *Bulimus* or *Clausilla*.

It is worth mentioning the little flora. Our specimens were kindly identified for me by Professor Heilbrunn of Istanbul University. There were several small fig trees, some clinging to the precipitous walls of the tower, and a little ivy creeps along the walls, without contact with the earth. There was also the Nettlewood Tree, *Celtis australis*, which is fairly common in the neighbourhood. The pigeons love their bluish berries, so perhaps the seeds were dropped up there by these ubiquitous birds. *Clematis vitalba* grows freely on the top, and there were a few shrubs of the Chermes Oak, which is one of the most prominent members of the flora on the surrounding hills. But who planted the acorns up there? Pigeons? There are a few *Pistacia mutica*, a charming tree that is common locally, a few bay shrubs, and the local white-flowered comfrey. Fifteen common local weeds were identified, probably mostly windblown or brought by birds, including succory, rocket, snapdragon, which is probably an escape, and a common creeping hedge plant, *Asparagus asper*, with its rough and harsh stems and foliage. That is 27 species of plants.

The Moth Trap in October, 1952 and 1953

By R. F. BRETHERTON, C.B., M.A., F.R.E.S.

Until the weather broke on the 26th, conditions in October 1953 in north-west Surrey were exceptionally favourable for the attraction of moths to light. There was very little wind; skies were frequently overcast; night temperatures were high and only once, early in the month, did the thermometer even on the grass touch freezing-point. October 1952, on the other hand, was a thoroughly bad month. The

contrast between the attendances of moths (Macrolepidoptera and Pyrales) at my light-trap at Ottershaw is so striking as to be worth analysis.

In both years I used a 'Robinson' trap with an 85-watt m.v. bulb, standing on the open lawn about 25 yards from the house. It was switched on only when the weather seemed reasonably favourable, and usually run until dawn, though on bad evenings it was brought in between 11 and 12 p.m. The count included, as far as possible, not only the insects actually in the trap, but also those sitting about on the outside and on the grass. This is quite an important point, as certain species, especially the 'Thorns' and the *Oporinia* group, are incorrigible sitters-out, and a count which ignores these can much understate their relative abundance. Some comparative statistics are set out below:—

	1952	1953
Total moths recorded in October	865	3668
Total species recorded	43	55
Number of nights worked	18	23
(of which part only)	6	2
Nightly average recorded	48	160
Maximum recorded on one night	121 (18th)	645 (12th)
Maximum species on one night	22	34
Dominant species (<i>Agrochola lychnidis</i> Schiff.) ...	366	1891

Thus the total of insects recorded was more than four times as great, and the nightly average more than three times as great, in 1953 as in 1952. It seems, however, that these differences were not wholly due to weather conditions in the month of October itself, but to some extent to more general differences in the progress of the two seasons. The emergence dates of moths were generally rather later throughout the autumn in 1953 than in 1952, so that more of the mainly September species were still flying well into October. This lateness in 1953, despite much more favourable autumn weather, is at first sight surprising. A probable explanation is that until July the weather in 1952 was much better than in 1953, so that the larvae of the autumn species fed up and pupated earlier. I have noticed the same point in breeding some of these species: the length of their pupal stage seems to be constant and little affected by temperature, but it is often possible to get early autumn emergences by forcing the larvae.

In both seasons *Agrochola lychnidis* Schiff. was the dominant October species. It accounted for 43% of the total in 1952 and 51% in 1953, and no other species approached 10% in either year. *Meganephria oxyacanthae* L., *Agrochola macilenta* Hb. and *Phlogophora meticulosa* L. accounted for a much larger proportion of the remainder in 1953 than in 1952, when *Triphaena pronuba* L. was the second most numerous species thanks apparently to a partial second brood, of which there was no trace this year. In neither year did October provide any of the scarcer migratory species; but *Agrotis ipsilon* Rott. was common in 1952 and *Plusia gamma* L. in 1953 was abundant: there was a few *Peridroma porphyrea* Schiff. in both years; and *Nomophila noctuella* Schiff. was represented by a single example in 1952 and not at all in 1953. Odd specimens of the partial second broods of *Hyppena proboscidalis* L. appeared in October in both years, and of *Rivula sericealis*

Scop., *Cleora rhomboidaria* Schiff., *Hypsogyia costalis* F. and *H. glaucinalis* L. in 1953: in 1952 these did not extend beyond September. *Aporophyla nigra* Haw., *Agrochola lota* Cl., *Anchoscelis litura* L., *Hydraecia micacea* Esp., *Thera obeliscata* Hb., *Conistra vaccinii* L. and *Eupsilia transversa* Hufn. provided a solid core of common species which were, relatively to the totals, about equally prominent in both seasons.

Though the 1952 total of species was only 43, against 55 in 1953, it contained one, *Tiliacea aurago* F. (three examples), which did not appear at all in the latter year, and five others, *Cirrhia icteritia* Hufn. (3), *Amphipyra tragopoginis* L. (1), *Scoliopteryx libatrix* L. (one, probably of a second brood), *Opisthograptis luteolata* L. (1), and *Nomophila noctuella* Schiff., which did not appear in October. In 1953 four species, *Anchoscelis helvola* L. (6), *Epione repandaria* Hufn. (4), *Griposia aprilina* L. (3), and *Episema caeruleocephala* L. (1), occurred which were not seen at all in 1952, and thirteen others which were not seen in October of that year: most of these were the mainly September species which were referred to earlier. A single specimen of *Oporinia christyi* Prout was detected for the first time in 1953: the species may well have been overlooked previously, but is certainly very much scarcer here than *O. dilutata* Schiff. and *O. autumnata* Bork. *Lithophane semibrunnea* Haw., which is generally a rare species here, appeared in October only in 1953 (two examples), though it came to the trap in the spring in both years. Of *Rhizedra lutosa* Hb. there were four in 1952 and seven in 1953: this moth must be a considerable wanderer, as the nearest reed-bed known to me is $1\frac{1}{2}$ miles away.

Statistical comparison with years before 1952 is not possible because the types of light-traps used were different. But two species, *Pyrausta nartialis* Guen. and *Orneodes hexadactyla* L., can be added to the list from earlier years, to bring the total number of Macrolepidoptera and Pyrales observed at light at Ottershaw during the month of October to 58. A few more, including that local speciality, *Dasycampa rubiginea* Schiff., have been taken at sugar or by other means. Who shall say that October is a dead month?

The East Coast Flood and Its Effect on Certain Species of Lepidoptera

By C. G. M. DE WORMS, M.A., Ph.D., F.R.E.S.

The great storm and sea flood which overwhelmed the East Coast on the night of 31st January-1st February 1953 caused loss and life and damage in this region without precedent for some 500 years. Professor Steers has estimated that over 200,000 acres were affected by sea water. The coast line from the Humber to the Wash, the Thames Estuary and even the south-east portion of Kent suffered severely in many low-lying areas. Naturally anxiety has been felt about many coastal species of our Lepidoptera after this terrible onslaught and incursion of the sea, especially as such favoured breeding grounds as sandhills were wholly swept away in many places, especially along the Lincolnshire coast, while near Lowestoft and Southwold long stretches of dunes were eliminated along the shore. Salt marshes often for a mile or more

inland were under sea-water for many days, while fresh marshes were invaded by salt water in many notable places, in particular along the coast in South Suffolk. Fortunately, however, in this great catastrophe the defences of the coastline at Horsey prevented a repetition of the 1938 disaster to the Norfolk Broads. The calamity at Canvey Island was by far the most grievous. Here an analysis of the local farm soil gave a yield of 0.5% of salt or 5 tons per acre. The north coast of Kent also took the full force and toll of the storm, while at Pegwell Bay the sea drove right over the golf course at Sandwich.

From these facts and data one can well visualise the potential damage and destruction to insect and especially lepidopterous life in the affected regions. Doubtless myriads of hibernating larvae perished in the flood, while those species with wintering ova may have had their foodplant killed by the saline conditions. Those species hibernating as pupae were probably less vulnerable. To take a few examples, egg masses of *Malacosoma castrensis* are well adapted for floating. Larvae of *Agrotis ripae* burrow deep into the sea sand for overwintering before pupation, but one wonders how such hibernating larvae as those of *Leucania litoralis* may have fared in the general destruction of the sandhills and huge stretches of marram. *Lithosia complana*, a common insect among the dunes of North Norfolk, is likely to have suffered badly in the larval state. There is little doubt that the sandhill species were the worst affected.

I will now deal with some of the more localised species associated with this portion of our coasts. There seems to be evidence from various on-the-spot investigations that none have suffered very materially, which is a most gratifying outcome.

Eilema pygmaeola Doubleday reappeared plentifully along that stretch of coast at Pegwell Bay, Kent, which is one of its headquarters. It was well out in numbers quite early in July this year. As to the colony on the sandhills at Waxham in Norfolk I have had no direct news, but I have little doubt this also has survived, since that part of the coast was not too seriously affected.

Arenostola elymi Treits. must have been eliminated from many localities where its foodplant flourished among the sandhills. As already mentioned, north of Lowestoft and at Southwold, where it used to be abundant, large tracts of dunes were completely washed away, but doubtless there are many spots where the lyme grass occurs in the area which were not affected. This species is so widespread up the east coast to Scotland that it cannot have been much depleted.

Nonagria neurica Hbn. In the restricted area where this insect has been discovered in Suffolk the sea made big inroads into the fresh marshes, but it is satisfactory to know that on 10th July this year Mr. P. J. Burton took a specimen at rest on a reed stem, so that it is evidently surviving without much fear of extinction through the salting of the reed-beds.

Aplasta ononaria Fuessl. Grave fear was felt about the colony at Sandwich where the sea broke in over its breeding ground with salt water remaining on it for several days. However, this species too reappeared there in fair numbers in July, General Johnson taking a specimen in the hotel along the sea front bordering the golf course.

Sterrrha ochrata Scop. which occurs with the last-mentioned species on

the same ground, was also quite numerous there. There is no reason to believe it was seriously affected in its other haunts at Aldeburgh in Suffolk.

Euchloris smaragdaria Fab. This Emerald, a denizen of salt marshes, must be used to seaflooding during its hibernation in the larval stage. I found a few larvae at Canvey as usual this autumn, but noted that much of the sea wormwood growing along the sea walls, one of its most favoured breeding grounds, was being destroyed in the strengthening of the walls against further flood damage. These operations along the Essex coast must have accounted for large numbers of the larvae of this restricted species.

Eupithecia extensaria Frey. The areas where this occurs in North Norfolk must have been very badly affected. It is to be hoped that the pupae were not submerged for sufficient time to be killed. Mr. Chipperfield visited some of the best ground in late September this year, 1953, but failed to find any larvae, which may have already pupated. Further investigation is required into this species on this stretch of the coast.

British Lepidoptera Collecting, 1953

1. January to the end of June

By C. G. M. DE WORMS, M.A., Ph.D., F.R.E.S.

I was greeted on my return from East Africa with a very bleak spell which lasted most of January and well into February. Collecting in earnest did not begin till the middle of that month. Most of the usual early species of Geometers were out by then in the Woking area with *Apocheima hispidaria* appearing on the 18th, *Achlya flavicornis* on the 21st February and *Orthosia incerta* and *O. gothica* the following day. *Biston strataria* was again plentiful at light from this date till well into March which proved to be a very cool month till the third week when sallows were well out in the Bracknell area. Here on 18th March *Orthosia cruda* and *O. stabilis* were in numbers. On the 20th I paid a visit to Mr. Austin Richardson at Minchinhampton. We travelled to South Wales later that day. In the locality in which we collected the sallows were at their height producing an abundance of *O. incerta*, *O. gothica* and *O. stabilis* with a sprinkling of *Pachnobia rubricosa* and *Panolis flammea* (*piniperda*). There was a spate of *Achlya flavicornis* and *B. strataria* to the m.v. light. I was in Kent on 29th March visiting the woods at Ham Street that evening. In spite of a high wind insects were fairly plentiful at sallows at which I had the satisfaction to take a couple of *Jodia croceago*, from one of which I subsequently bred a fine series. *Orthosia munda*, *O. miniosa* and *Graptolitha ornitopus* were among other visitors to the blooms.

The Easter holiday proved a very fine and most propitious period. On 3rd April I spent a morning sawing off birch stumps in Swinley Forest. These later produced a number of *Aegeria culiciformis*. That evening was a memorable occasion in the Chiddingfold area where I was accompanied by Mr. R. Bretherton. Moths were swarming at the sallows, mainly *O. gothica*, *O. incerta*, *O. miniosa* with a few *O. munda*, *P. rubricosa* and *Xylocampa areola* together with single examples of *Gypsotea leucographa*, *Lithophane socia* and *J. croceago*. The next

day I travelled to Carlisle to stay with Major General Johnson. On the 5th, Easter Sunday, we motored via Ullswater to Grange-over-Sands. It was a mild and drizzly evening when we ventured to the woods near Witherslack where we were joined by Dr. N. Birkett. Sallows were once more well patronised. We recorded a dozen *G. leucographa* and many *O. miniosa* at light, while searching the small ash saplings yielded a nice series of *Nothopteryx polycommata* just out. The next night was less good in the same locality where we saw half a dozen each of *G. leucographa* and *N. polycommata*. Ova were obtained from the former species and a large brood of larvae brought to the pupal stage. On the morning of 8th April I accompanied General Johnson to a locality in the Carlisle area where larvae of *Euphydryas aurinia* were abundant and nearly full-fed already. A good series with heavy markings was later bred from this source. I returned south later that day.

The 11th April proved yet another remarkable night in the Chiddingfold district (see *Ent. Rec.*, 65: 182). Mr. R. Bretherton, Mr. D. Messenger and I were kept busy at the sallows till a late hour. Among a host of *O. miniosa*, *O. stabilis* and *P. rubricosa* we saw four *G. leucographa*, including three females, a single *J. croceago*, several *Nothopteryx carpinata* and *Lycia hirtaria*. I was in the same area the next night with Mr. A. Wightman and Mr. G. Manley, but a mist descended and little appeared at the sallows. Spring butterflies were on the wing on 18th April when I was in the New Forest, chiefly *Pieris rapae* and *Anthocharis cardamines*. The next day, which was very warm, I was delighted to find a freshly emerged female *Odontosia carmelita* in the Brockenhurst area (see *Ent. Rec.*, 65: 183). That evening Dr. H. King and I joined Mr. R. P. Demuth in a well wooded spot near Brockenhurst. *Drymonia ruficornis (chaonia)* was numerous at the m.v. light with a few *Polyphlocia ridens*, while with some agility we managed to net several *Eupithecia irriguata* circling round the lamp. The next day I found larvae of *Callimorpha dominula* full-fed near Salisbury. I was again in the New Forest with Mr. D. Messenger on 26th April. *Cleora cinctaria* was starting to appear near Beaulieu Road station, while we found another female *O. carmelita* on a birch trunk in the same locality as that of the previous Sunday (*loc. cit.*).

On the evening of 28th April I travelled to Aviemore where I was greeted with a very dull and cool spell. However, searching posts on Granish Moor the next day produced a number of *Anarta cordigera* freshly out. These became more plentiful in this spot the next two days. On 1st May I saw the first *Isturgia carbonaria*. The sight of several skeins of wild geese flying north seemed to presage a warmer period which duly set in on the 2nd, when I found a pair of *Endromis versicolora*. *Thecla rubi* was well out now. Later that day I journeyed to Newtonmore to join Commander G. W. Harper. In spite of the mild conditions his m.v. lamp that night attracted only *A. flavicornis* and *Ectropis bistortata*. Summerlike weather had now brought out many spring insects. *Lampropteryx suffumata* came to light on the 3rd. Commander Harper's trap was well patronised by many species, including *Pheosia gnoma*, *N. carpinata*, *Chesias rufata*, *Anticlea derivata (nigrofasciaria)* and *Selenia tetralunaria*. The next morning on a heath near Kingussie *T. rubi* was swarming. The first *Hadena bombycina (glauca)* were seen together with many *I. carbonaria*. In the early

afternoon male *Saturnia pavonia* were on the move. That evening the m.v. light drew a large company in a marshy area along the Loch Laggan road. By midnight we had recorded over a dozen *S. tetralunaria*, including one female, many *O. gothica* of all varieties, several *Orthosia gracilis* and *H. bombycina*, quite a run of *L. suffumata* with a good proportion of f. *piceata*, also *Notodonta ziczac*, *P. gnoma* and *Selenia bilunaria*. The 5th May proved to be one of the warmest days I have ever experienced in the Highlands, causing one to collect in shirt sleeves. While searching some gnarled birch trunks in the afternoon, about 4 p.m. I had the thrill to spot a pair of *O. carmelita*. Within two hours the female had laid some eighty ova, all fertile. That evening I travelled south once more, very well pleased with the closing days of my visit.

The fine spell continued for nearly a fortnight, but I did not undertake another collecting expedition till the middle of the month when I visited Mr. R. E. Ellison at Eastbourne. On the afternoon of the 16th I joined him and Mr. Hutchinson in Abbott's Wood, but little was flying owing to an overcast sky. However, I beat several nearly full-fed larvae of *Trichiura crataegi*. The warm weather returned next day when we walked round the local downs. *Pyrgus malvae* was much in evidence. We took three extreme f. *taras* and several intermediates. *Polyommatus icarus* was just appearing as also was *Clossiana selene* later that day in Abbott's Wood. *C. euphrosyne* was already getting worn. At Mr. Ellison's house that evening we took some *Eupithecia dodoneata* and *Nola confusalis*. On 20th May, another very warm day, *C. euphrosyne* was very numerous in Oxshott coverts. That night Mr. Bretherton, Mr. Messenger and I made Box Hill our venue. The short grass was covered after dark with *P. icarus* at rest, while the main visitor to our lamps was *Agrotis cinerea*, of which we took a single female. *Horisme vitalbata* was also out.

I spent the last week of the month, which included the Whitsun holiday, in Belgium. On the 31st Dr. N. Birkett came over to Woking. Working one of the local heaths only produced one female *Dyscia fugaria* and a few larvae of *Amathes castanea*.

June opened with a very chilly spell which lasted over the Coronation period. On the 5th I travelled to Sheffield to stay with Mr. W. Reid, but very unpropitious conditions prevented any outstanding captures at his m.v. light set up in his garden on the outskirts of the city. The most interesting visitors were dark forms of *Abrostola tripartita* and *Dysstroma truncata*. Other species seen at the light included *H. bombycina*, *Hadena thalassina*, many *Noctua festiva* and some good forms of *Gonodontis bidentata*. On the 7th we went over to Sherwood Forest where larvae of *Thecla quercus* were in great plenty as well as a few of *Pseudoips prasinana* (*bicolorana*). Back in the south some very warm weather began in the second week in June. Conditions were very favourable when Mr. Messenger and I visited Tilgate Forest on the 11th. We were kept busy till 1 a.m. at our Tilley lamps. *Tethea fluctuosa* was already well out. We saw a few *Haplotis venustula* at the lights together with numbers of *Jaspidia pygarga*, *Electrophaes corylata*, *Hydriomena coerulata* and *Semiothisa notata*, but no *Cerura bicuspis* appeared though several were taken during this period.

On 12th June I motored to Woodwalton Fen where I was joined by

Mr. W. Quibell. It was a very mild night with a light drizzle. The sugar patches were well patronised mainly by *Apamea unanymis*, very fresh and variable. Many very dark forms were seen. *Polia nebulosa* was the next most numerous with a few *Eumichtis adusta*, but only one *Leucania obsoleta*. Very little of interest came to light. The next day we did a survey of the Breck sand area, chiefly to try to locate *Silene otites*, the foodplant of *Anèpia irregularis*. In spots where it used to be abundant only a few scattered plants were found. Only in one very restricted area was it in any way plentiful, which is not very encouraging for the very local insect it harbours. A second night at Woodwalton produced in addition to the species already mentioned *Tethea* or and one *Arenostola concolor (extrema)* at light at 1 a.m.

I visited the Ham Street woods for the following week-end, on 20th June. At dusk *Angerona prunaria* was plentiful, but sugar attracted only a single *Tethea ocularis* and some *Polia tinctoria* and *P. nebulosa*. *Pterostoma palpina* was the only visitor to light that night. I went over to Sandwich the next morning, but saw only *Mesotype virgata*. *Lysandra bellargus* was well out on the downs behind Folkestone. That evening I took a female *Cossus cossus* at the sugar at Ham Street.

The 22nd June, a very fine day, I spent at Dungeness where *Eupithecia pulchellata* was in numbers with an occasional *Hadena conspersa (nana)*, *H. lepida* and *H. serena* on the posts. That evening I went to Westwell to sample Dr. E. Scott's well-known downland locality. I was surprised to see several *Diacrisia sannio* on the sugar with many *Agrotis exclamatoris* and an *Apamea characteria (hepatica)*. At the m.v. light by the house a single *Lophopteryx cucullina* came quite early and later *Deilephila elpenor*, *D. porcellus* and *Stauropus fagi*. Some remarkably warm weather was the feature of the last week of June. On the 24th, a very heavy night, Mr. Ellison and I drove to Tilgate Forest after attending a meeting of the South London Society. Arriving about 10 p.m. moths soon flocked to our Tilley lamps on top of the tunnel. There was still a steady stream when we left at 1 a.m. By that time we had counted nearly sixty *T. fluctuosa*, which kept coming in little rushes from an early hour. Among the fifty species recorded at the lamps were several *S. fagi*, *Apatele leporina*, *P. nebulosa*, *P. tinctoria*, *S. notata*, *Euphyia unangulata*, *H. coerulata*, *Bapta bimaculata*, *A. prunaria* and *Biston betularia*, but no *Apatele alni* which had been prevalent there early in the month.

On 27th June I motored to the New Forest. En route I halted at Alice Holt Forest where *Limenitis camilla* was just appearing. On the downs near Winchester *Melanargia galathea* was already well out. That evening Dr. H. King joined me in the Emery Down area. At dusk we searched the low bilberry with our lamps taking several *Bomolocha crassalis (fontis)* and a dozen quite fresh *Chloroclystis debiliata* which also came to light in fair numbers. Other visitors included *Cleora lichenaria* and a fine *Alcis repandata f. conversaria*, also *Cosymbia linearia*. The next day I spent searching for larvae of *O. gracilis* which were fairly plentiful in the bog-myrtle. In the evening I proceeded to West Wittering where sugar was quite productive, a few *Leucania litoralis*, *L. favicolor*, *Heliophobus albicollis* and *Apamea oblonga (abjecta)* being taken.

(To be continued.)

A Few Notes on *Cirrhia ocellaris* Bork.

By H. C. HUGGINS.

"Apparently still rarer species with us are *Mellinia ocellaris*, of which our member, Mr. Burrows, has taken and shown us a specimen; *Sesia* (*Aegeria*) *andreniformis*, taken by Mr. Huggins at Gravesend on July 17th; and *Parascotia* (*Boletobia*) *fuliginaria*, captured by my friend Mr. R. W. Robbins at Walthamstow on July 29th."

This extract from the late L. B. Prout's review of the season 1901 in his presidential address to the City of London Entomological Society makes queer reading today. Few present-day collectors would select those three species as the 'star' captures of the year, yet then the British specimens of *ocellaris* and *fuliginaria* were certainly below 25 and my *andreniformis*, for which I refused an offer of £5 from Eustace Banks, was the fifth. I have it still, and a miserable little one it is, netted from a dogwood leaf whilst I was assembling *L. quercus*. Perhaps one day we shall be treating *zollikoferi* and *alchymista* with as little respect.

The capture of that *ocellaris* at sugar in his garden at Mucking, Essex, by C. R. N. Burrows has always made me feel a kind of proprietary interest in the species, as not only was it linked with my own great boyish capture but also he gave me a pre-view of it and carefully pointed out the distinctions between it and *gilvago*.

Today, of course, the moth is easy enough to get if a locality where it occurs be known. All that is required is to watch the nearest tree of male black poplar, and directly the red catkins have fallen, to go off to the *ocellaris* place and pick up a supply of the catkins there and place them on the surface of the earth in a big flowerpot with plenty of drainage. In two or three weeks the young larvae will begin to come out of the catkins and may then be fed with young poplar leaves of any sort till they disappear in the earth. Nothing more need be done except leave the pot out of doors, and in September *ocellaris* will emerge without difficulty. This year I decided to increase my series of *ocellaris*, and as I had long since given away all my duplicates I visited a Breck locality for half an hour. From less than a pint of the red catkins gathered I reared 19 moths without the slightest difficulty.

C. ocellaris is also easy to rear from the egg. A captured female lays readily on the buds of a poplar twig, and the larva will go straight into the catkins provided directly it hatches. I usually provide the young catkins partially covered by the sheathing-bud to begin with. The only difficulty in rearing from the egg is to keep the eggs cool enough so that they do not hatch before the catkins are ready, but in 1937 I successfully reared larvae that hatched prematurely by starting them on aspen catkins, which appear long before the poplar ones. These moths emerged in early July instead of September. It is perhaps needless to say the eggs are laid in the autumn.

To take a female or so for eggs it is not necessary to sugar for it, especially as like most "sallows" it is somewhat capricious, turning up in dozens some nights and on some not appearing at all. In early September break the ends of a few low twigs of black poplar, so as to leave a bunch of withered leaves. A fortnight later this may be shaken

over a net or tray, and *ocellaris*, mostly females, will fall down. I last tried this trick with the late W. S. Gilles in 1936 near Sudbury and between us we got over a dozen *ocellaris* from about twenty bunches. Gilles was told the dodge by the late Bernard Harwood, who said it worked equally well with *gilvago* on wych elm, or *croceago* on oak. It certainly works with *gilvago* on wych elm, or any broad-leaved tree; we took two *gilvago* with the *ocellaris* at Sudbury on the dead poplar leaves, which had doubtless come from neighbouring elms. As to *croceago* I cannot say; in the localities where I collect there are so few *croceago* to so many oaks—"so much water and so few fishes".

The variation in *ocellaris* and *gilvago* seems to run on parallel lines; there is the usual dusky form, and the form with a light ground colour with a distinct spotted band. Douglas Smart used to call this the *gilvago* form of *ocellaris*, whilst Harwood used to call the parallel insect the *ocellaris* form of *gilvago*. In both insects the banded form is uncommon; in *ocellaris* in the Breck and Thames Valley it seems to be about one in ten (I bred two in my nineteen this year); but I never saw it at all at Sudbury.

There appears to be one unsolved mystery about this moth, the food in nature after the larva leaves the catkin. It cannot be the fallen catkins as, unlike those of the willow, these disintegrate entirely before the larva is full grown. I have noticed, however, that until the last instar in captivity the larvae spin hiding-places in the young poplar leaves provided; in the last instar they hide on the surface of the earth. It seems possible therefore that in nature they spin amongst the higher leaves till then, and after that ascend the tree to feed at night, living on the ground by day.

Notes on Lepidoptera, 1952-53

By F. M. B. CARR.

(Continued from page 290.)

Some forty years ago my wife and I spent two summer holidays at Llandrindod Wells. Walking and cycling we explored the beautiful Radnorshire countryside and saw enough of its entomological possibilities to make me wish for a further acquaintance with it. With this end in view I left Chester on 29th June and halted en route at Church Stretton. Here, as arranged, Mr. and Mrs. Symes, who had motored there from Bournemouth, met me. Our plan was to have a day on Whixall Moss and on 1st July to go on to Llandrindod Wells for a week. On the Moss, in addition to *Coenonympha tullia*, we put up an occasional *Sterrhia muricata*. But alas! Radnorshire proved a sad disappointment. Nothing was seen of the more desirable species taken by me there in 1911 and 1913, e.g. *Ammogrotis lucerneae* and *Plusia interrogationis*. Indeed there was a strange scarcity of anything lepidopterous. *Cucullia umbratica* was fairly common on posts, and an occasional *Scopula ternata*, *Lygris populata*, *Epirrhoe galiata* and *E. tristata* appeared. We found several batches of *Saturnia pavonia* larvae and one larva only of *Apatele menyanthidis*.

I returned to Mudeford on 8th July to find day collecting almost useless owing to persistently cold windy weather. One example must

suffice, the date being 30th July. On this day Dr. King and I went forth to the New Forest to seek the elusive larva of *Moma alpium*, but never a one! For six hours we beat. Larvae of any kind were extremely scarce, and the best we could manage were three *Drymonia trimacula*. The next day I wrote in my diary "Thus ends the worst July for weather and collecting that I can remember".

With August came better weather. On the 14th Mr. B. C. Barton and I visited woods in the Salisbury area for larvae of *Cucullia asteris*. We soon found on the golden-rod as many as we wanted. This done we spent some time beating oak and sallow, etc., but except for two larvae of *Atolmis rubricollis* and one *Notodonta ziczac* we beat very little. We ended the day on the open down, where we found a good colony of *Hesperia comma*.

Five days later we went to Hod Hill. Here we saw only four males of *Lysandra bellargus*, but beat from privet a fair number of *Cranio-phora ligustri* larvae.

We made a second trip to the same locality on 28th August, hoping to find *L. bellargus* in strength, but though fine the sun shone but little and we saw only about a couple of dozen. Yet this small number included ab. *caeca* and ab. *obsoleta*, one of each. When Mr. Symes and I went again on 7th September the species was still in small numbers, but between us we took several of these two aberrations. Another feature of this visit was the quite exceptional abundance of *Aglais urticae*, sitting on the scabious and on anything and everything that offered a meal.

Between these two visits to Hod Hill Mr. Symes and I had a fairly good day's larva-beating on Cranborne Chase, larvae including *Apatete leporina* (4), *A. tridens* (2) and a few *C. ligustri*.

On 9th September Mr. Barton and I went to Portland where we found plenty of larvae of *Cucullia absinthii*.

On 14th September Dr. King and I went to the New Forest to beat for the larvae of *Cosymbia orbicularia*, and in this were highly successful. Other larvae that fell into our trays included several *N. ziczac* and *Pterostoma palpina*.

A large patch of *Nicotiana* in my garden delighted the family over a long period with its fragrance, but never a "hawk" did I see at it. My one *Herse convolvuli* of the season came to me on 19th September not sublimely but ridiculously. She sat about 12 feet up on the outside wall of a large store in Bournemouth. I debated with myself whether I should buy a long bamboo or borrow a short ladder, and finally decided on the ladder. An obliging porter in a white overall co-operated, and up I went to the penultimate rung. When I regained terra firma with my *convolvuli* safely boxed a host of white-coated porters appeared from nowhere demanding to see the prodigy that all unbeknownst had been sitting on their wall. Introductions followed and all was well.

The 25th September, a lovely warm sunny day, was spent in larva-beating with Mr. Symes at Buzbury Camp. Here we did quite well, taking larvae of *Gastropacha quercifolia* (5), *Drepana cultraria* (4), *Atolmis rubricollis* (8), *Colocasia coryli* (4), *Hemistola chrysoprasaria*, *Horisme tersata* and *Ligdia adustata*.

I treacled in the garden at Mudeford spasmodically in July and August, and regularly in September. I often felt inclined to give it

up, as until 26th September only a few common moths appeared on the patches. But on that date the luck changed and I was glad that I had persevered. *Amathes castanea* (*neglecta*) was a surprise as I know of no heath in the neighbourhood. *Aporophyla nigra* made its first appearance of the season, to be followed by others on subsequent evenings. The evening of 27th September was a good one, with a lovely *Leucania vitellina* and *L. l-album* as the 'star turns'. The latter was my second record for Mudeford.

I saw no more of these two species, but treacling continued good throughout October, a month in which we enjoyed much beautiful weather. *Lithophane semibrunnea* (16) and *L. socia* (12) head the list, with a good sprinkling of commoner species such as *Griposia aprilina*, *Agrochola lota*, *A. macilenta*, *Graptolitha ornitopus* and *Conistra ligula*. Now and then *Rhizedra lutosa* appeared, also one *Schrankia costae-strigalis* and a few *Sarrothripus revayana*.

It was light, however, that produced far more than any other means of collecting. I am still without a mercury vapour lamp trap. Judging by Mr. Barton's experiences, rather more than a mile away at Highcliffe, I might expect to do very much better with one and spare myself many late nights. However, there were many additions to my previous records for Mudeford, notably *Cerura furcula*, *Pheosia tremula*, *Euprocitis chrysorrhoea*, *Gastropacha quercifolia*, *Cynia mendica*, *Eilema deplana*, *Apamea ophiogramma*, *Hadena lepida*, *Leucania obsoleta*, *Orthosia gracilis*, *Cosmia pyralina*, *Atethmia xerampelina*, *Heliothis peltigera* ab. *pallida*, *Plusia ni*, *Lampropteryx suffumata*, *Mesoleuca albicillata*, *Chesias legatella* and *Epione repandaria* (*apiciaria*). Of the above, *A. xerampelina* came in numbers to Mr. Barton's trap. I took my *H. peltigera* on 11th June, and *Plusia ni* on 18th August.

I do not know what is the status in Hampshire of *E. chrysorrhoea*. I have not previously met with it in the county in any stage.

An Entomologist in Argentina

III. Exploring for Locusts

By KENNETH J. HAYWARD, D.Sc. (Hon.), F.R.E.S.

To readers who expect something about entomology, this instalment will prove a disappointment. I include it to maintain the continuity of my reminiscences since the journey played no small part in my entomological life. It is a tale of small adventures; insects play but little part.

During the autumn of 1933 the Ministry of Agriculture, ever more perturbed at the increasing damage caused by locusts, decided to explore thoroughly the northern portion of the country in an effort to ascertain where these insects overwintered. With this idea in view they equipped eight small expeditions and, as previously mentioned, I was offered the leadership of one of these and because of my knowledge of the area in which it was to operate, was given that destined to cover La Rioja and certain portions of the adjacent provinces, a total area rather larger than the British Isles. I was assigned two technical assistants and authorised to spend a certain sum but beyond this everything was left to my own judgment.

On arriving in Buenos Aires I found myself plunged into a whirl of

preparations, planning the route we were to follow and accumulating the necessary stores, mainly camp equipment and saddlery. In addition each expedition received a large case of medical supplies that appeared sufficient to stock a small hospital and which I conveniently discarded, selecting only the absolute necessities. We were also authorised to apply to the local army commanders of our respective zones for a non-commissioned officer and six men to accompany us, but I did not avail myself of this suggested addition to our forces.

My party left for Córdoba on 24th May, arriving the following day. It was cold and grey but as I had nothing better to do I went out collecting, finding only a number of cases of two species of bagworm (*Psychidae*), one of which was hibernating in large quantities on the posts of a railway fence. Though these seemed far too common to be of any interest, both proved to be undescribed and were two of the very few insects we discovered that were new to science.

The next morning we continued on to La Rioja, a journey in those days of about twenty-four hours, the steam train following the route through the beautiful Córdoba hills before turning westwards across the semi-arid plain covered for the most part with *jarilla* and *Prosopis* and low scrub forest. We arrived early in the day and after paying the usual courtesy calls on the local authorities I went to see my old friend Brother Gómez at the San Francisco monastery, where I had previously stayed as a guest whilst helping him sort out and catalogue his small collection of pre-colonial Indian relics, which over the years has grown to be one of the most important in the country and now forms the Inca Huasi Archeological Museum. It was an unforgettable fortnight. I slept in a small simply furnished 'cell' and ate with the Brothers at their long refectory table, innocent of cloth, and after the evening meal they recounted tales of old-time La Rioja. When I took my morning bath it was to the song of many canaries, for one of the Brothers bred them and at night hung their cages in the bathroom that was mine to use.

Returning to the village of Serrezuela that lay just over the border into Córdoba, we put up at a small *pensión* where they served us a white Chilcito wine that still lingers in my memory. Here we remained for a little over a week as there were local arrangements to be made and I had to find a car, since it was my intention to travel as much as possible by this means, resorting to mules or horses only when it became necessary to leave the main tracks and enter more deeply into the mountains. This period of semi-inactivity was passed in exploring the neighbourhood, especially the low scrub and cactus covered hills to the south; but the nights were cold and there were few insects to be found.

Before leaving I had been asked to do what I could to get together a representative collection of the region's cactus for the Ministry's greenhouses, and as we were visiting out of the way places from which little or no botanical material had ever been received, to collect plants. This additional task was welcome, as in the almost complete absence of insects it provided us with an interest that went far to relieve the monotony of long hours of travel and sometimes led us into little valleys that we should not otherwise have troubled to visit. In the end we were able to send a large assortment of cacti to Buenos Aires, and in spite of its being winter we made a fair collection of flowering plants and cryptogams.

We had some difficulty in finding a suitable car but eventually located a 1928-model Ford at a reasonable rental. I do not think that any other car of that period would have stood up to what we asked of it and survived the ordeal. We covered more than 4,000 miles and some idea of the state of the roads in those days will be gathered when I add that our average speed for the entire distance was thirteen miles an hour and that we only twice touched thirty. Often we were compelled to dig our way down into and out of gullies where they cut the roads or lay down tracks of branches to get us over soft sandy stretches where the wheels sank deep, and even though we carried eight spare inner tubes these frequently proved insufficient when our way lay over thorny scrub or cactus-covered wastes.

It was not till 3rd June that we finally got away from Serrezuela, crossing the plains to the Sierras of Malazán, skirting their eastern slopes to Chepes and then continuing southwards into San Luis to make a complete circuit of the Sierras of Ulapes, a journey not without adventure since for much of the way no roads existed. Failing to find any trace of locusts in this area we turned our attention westwards into northern San Juan, proceeding to the well watered Valle Fértil which was a distinct change from the arid scrub-covered country we had so far traversed. Here we remained for several days and it was the only place where we made any considerable collection of plants, as in spite of the cold nights a fair number were in flower in some of the more sheltered valleys. Here too when the sun had warmed the air a few butterflies appeared, the usual common species I have since learned to associate with our north-western valleys in winter, the ubiquitous clouded yellow and our commonest *Vanessa*, a *Tatochila* white and three very common *Pyrgus* skippers, *Eurema deva* whose foodplant *Cassia aphylla* grows everywhere in the dry scrub forest, and occasional fresh specimens of the Danaid *Diogas erippus* beguiled into emergence by the warmth of the winter sun. In a tiny stream at whose edges ice formed nightly, Gyrinidae were swimming and, what was perhaps more surprising, abundant water-striders skated over the surface of the stiller pools. One unusual note was the finding of a noctuid chrysalid within an empty case of the *Oiketicus kirbyi* bagworm, the only occasion on which I have ever seen one of these being made use of by any other insect.

Since only a bridle track connected Valle Fértil with central La Rioja it was necessary to retrace our route to Chepes before following up the western side of the Sierras of Malanzán and Tama with their delightful little valleys and continuing across the plain to Patquia. Here we arrived with the back spring of the car completely smashed, and as there was no way of getting it repaired in the village we borrowed tools from the railway and cutting a suitable sapling bent it into shape and lashed it in place with wire to form a temporary wooden spring. With this we managed the following day to reach Chilecito even though the eighty-five miles took us exactly twelve hours. The road, which cuts through the Colorados, crosses some of the most desolate country that can be imagined till at Vichigasta, twenty miles from Chilecito, one enters the grape growing area of La Rioja. It was near this latter village on a previous trip that, having stopped at a small roadside *almacén* or general store to get something to eat, I discovered its owner

to have been a sergeant in a Greek battalion that had been for some time under my charge during the 1914-18 war.

After a short trip to Famatina at the foot of the 20,000 ft. peak of that name we returned to Chilecito to cross the Cuesta de Miranda into the western valleys that skirt the pre-cordillera, following these northwards to Vinchina where they end. It had long been my desire to visit a small lake that existed back in the high mountains about two days by mule beyond Vinchina but we found that the paths were blocked with snow, and as both my assistants fell victims to *puna* or mountain sickness (not caused by altitude alone as is generally supposed but by a combination of certain factors), I had no choice but to cut short my stay in this interesting district and return. A few days previously we had been basking in a temperature of 83° F., but now our night readings were falling below 20° and I was therefore surprised to find a fair number of insects in some of the valleys and a very active colony of *Aethalion reticulatum* (Homoptera) on some willows near a water channel at Vinchina.

Back in Chilecito we had again to garage our car for repairs but as soon as these were completed we lost no time in leaving for Tinogasta in Catamarca, following a little used western trail that led us across long stretches of sand dunes. We spent about a week where La Rioja and Catamarca join, sometimes on the vast plains where the only vegetation consists of countless millions of the small *Opuntia glomerata*, sometimes exploring the western valleys of the Velascos in one of which I found a number of fasciated *Cleistocactus*, unusual since abnormal specimens of this cactus seem very rare. We paid a visit to the Aimogasta district, famous for its olives and where there is a four-hundred-year old tree that still bears its annual crop, a tree that either by accident or design escaped destruction when in obedience to a *Real Cédula* issued in the seventeenth century by the Spanish Court, all the local olive trees were cut down so that their production should not compete with that of Spain.

More than six weeks had now passed since we had left Serrezuela, and although we had accumulated much information we still had found no signs of overwintering locusts. It remained only to explore the extreme north-eastern corner of our area and the salt marshes lying to the east. Before setting out on this last leg of our travels we returned to La Rioja, following a track along the western face of the Velascos, one of the most dangerous trips it has been my lot to undertake. As a new road was under construction, the old one had been allowed to fall into disrepair and in many places the surface soil had washed away, leaving only stones and small boulders over which the car slithered erratically, whilst only a foot or two to our right a sheer drop awaited us into the valley far below. Nor were we made any happier by having a shower of dirt and small stones descend on us following blasting on the new road which was higher up the mountainside.

After a short delay we started north, thinking little of locusts as only that same morning we had been assured by the local authorities that none existed in the province. We were therefore greatly surprised when after travelling about twenty-five miles we found ourselves in the midst of a swarm that covered many square miles and had according to local information been there for more than a week. This discovery led

us to change our plans and for several days we remained with the locusts, following them during their short midday flights till we temporarily lost them in the mountains west of Chumbicha in which small town, the northern limit of our area, we made our headquarters. Since we found the hotel impossible we bargained with the stationmaster for the use of the waiting room, which was just large enough to accommodate our three camp beds, and arranged with him to give us food, which he served in the ticket office. As there were only three trains a week I do not think that the railway was seriously inconvenienced.

We were now experiencing another of those cold spells that made the winter of 1931 memorable in this respect, the night temperatures dropping as low as 14° F. This gave me an opportunity to make some observations on the cold hardiness of the locust (*Schistocerca paranensis*) and it was not till five or six days after the onset of this cold that I began to notice any mortality. By eight o'clock in the mornings they were already crawling about although the temperature was still far below freezing point, but as soon as the sun dropped behind the mountains towards mid-afternoon they would pile up round the trunks of trees in cone shaped heaps or crowd together in hollows or under fallen branches, seeking shelter and mutual warmth. Eventually the cold spell broke and when the locusts moved again they passed out of our area and I handed them over to the expedition working to our north.

We had still to explore the extreme eastern border of the province, an area of scrub forest and salt marshes, and to cover this ground we made a wide sweep eastwards before turning south again to La Rioja, a distance of some two hundred and fifty miles. On our last day we followed a track through open forest and here we saw a *mayuatú* or South American food-washing racoon (*Procyon cancrivorus*), the only specimen I have seen out of captivity, and a puma ran ahead of us for some distance. Our great adventure was however still to come. On stopping to remove an obstruction from the path I noticed that the engine was overheated and found that somewhere we had hit a hidden stump and broken off our oil drainage cock and in consequence were without oil. We still had thirty miles of rutted track to cover, and although it was a simple matter to plug the broken pipe, the question of what to use for lubrication was another matter as, expecting to be in La Rioja that night, I had used up the last of our reserves. However, necessity stimulates the brain, and seeing a herd of goats grazing nearby I bought two of them and had them killed and stripped of fat, and this we melted down and poured into the engine. With frequent stops to allow the motor to cool we reached our destination late in the evening. It was not till I had garaged the car that I understood why our progress through the town had attracted so much attention. It would not have been strange had we, like the Pied Piper and his rats, attracted in our wake all the cats and dogs of La Rioja, such was the pungent smell of burning fat we trailed behind us.

Our exploration was now practically finished and after a few days spent amongst the eastern salt marshes we collected our scattered cases and equipment, and whilst two of us returned to Buenos Aires, the third member of the party took our car back to San Juan from where it had been obtained, a distance of rather over three hundred miles of

sandy track. Here our faithful steed was to receive its last jolt, for the petrol which I had ordered to be sent ahead, since none was available along the route, although packed and labelled as such, turned out to be kerosene and on this substitute the journey was completed.

Although my report was negative as regards areas where the locust overwintered it was still valuable as it enabled this zone to be excluded from future exploration. My observations had led me to suspect that the female locust laid several times and did not, as was the prevalent idea in those days, lay her hundred or so eggs and then turn up her tarsi. When I expounded this theory to the Central Committee they were sceptical and smiled, but subsequent investigation proved me right. Another indirect result of the trip was a series of experiments I carried out when opportunity offered a few years later on the destruction of locust eggs by the adults and larvae of the beetle *Trox suberosus*, experiments suggested by the frequent mention of this beetle, called locally *champi*, by people with whom we conversed during our travels.

From an entomological point of view little was achieved beyond the discovery of three or four new species and the addition of a few new records to the country's list. It had however given me the chance to explore thoroughly the lesser known corners of La Rioja, and the knowledge I gained has stood me in good stead over the succeeding years.

It was a trip filled with small adventures that have no place in this account but which remain graven on my memory. Our daylight hours were spent under sunny winter skies in the invigorating air of mountain valleys and our nights where darkness found us, in town or farm or village or beneath the stars.

West Country Tour

By AN OLD MOTH-HUNTER.

When I was sixteen I made an entomological expedition by bicycle into the West Country; for in those days I collected and I wanted to add several species to the cabinet which an indulgent parent had given me. The maker of the bicycle called it a "road racer"; but before the coming of the motor-car there were precious few country roads on which one could 'race'. In dry weather most of them were blanketed with dust two to four inches thick and in wet weather the potholes were miniature ponds of similar depth.

I wandered through Dorset, stopping wherever the mood took me—which was quite often, for the bicycle and I did not agree on the subject of road racing—and I remember making a sketch of stocks on a village green—I think it was one of the several villages called Gussage which were dedicated to various saints. Doubtless the stocks have long since been used for firewood. On heaths I found *Plebeius argus* and, here and there in chalky spots, *Cupido minimus*. This little butterfly always seems—in my experience—to have rather restricted habitats. One never finds it in profusion over a hundred and more acres as one does *Lysandra coridon* and other Blues, at least I never have. Even on such a wide expanse as Newmarket Heath it is confined to a few acres. *Leucophasia sinapis* was common, on 26th July, in Burlescombe Wood, Somerset, and perhaps it is common there still, if the wood has not been felled.

On the 27th July it rained. Not just summer showers but a dour, soulless, downpour which soon had me wet to the skin. Strapped inside the frame of my bicycle was a more or less triangular case—(Good God! says the purist; how on earth can a triangle be “more or less”?—Pay no attention, reader—the bottom angle was square)—which fitted the frame of the bicycle nicely and was about four or five inches thick. In this were stored my spare shirt, vest and socks, sleeping suit, shaving tackle (perhaps ‘down-remover’ would be more accurate considering my age), bath-sponge, soap, towel, hair-brushes, and entomological impedimenta. All these things, especially the sponge, had a great attraction for the rain. When I reached Moreton Hampstead I was in much the same condition as a Persian cat which has been floating about off the port of Basra for a week or two.

The White Hart inn looked inviting, so I dismounted, discarded the bicycle, and asked if I could have a meal and my clothes dried. The landlady, who was a fat motherly woman, took me to a bedroom, told me to strip and put my clothes outside the door, and in an hour they would be returned to me dried and a hot meal ready. Till then I was to lie in bed. So I lay naked in bed until a pretty young maid came in with my clothes and told me that dinner would be ready in five minutes. I told her not to be in a hurry to go, so she sat down beside the bed and put her arms round my neck and kissed me. . . . She really was very pretty, and I was very young. . . . I thought this was an excellent introduction to Devonshire. However, she was afraid that mistress would come up after her if she didn't hurry, so off she went, and I got into my warm dry clothes.

When I came downstairs I was shown into a parlour with a cheerful fire, and presently the little maid brought in a large roast fowl, a steaming hot boiled gammon, and a truly royal dish piled high with potatoes and French beans. The accoutrements were a quartern loaf (home baked), half a pound of butter, and a large round cheese. If I had been hungry when I arrived I was ravenous by now, and I consumed the whole of the fowl except bones and chitin and most of the gammon. I also ate the best part of the loaf and nearly—but not quite—all the vegetables, at least half the butter, and a considerable lump of cheese. These were washed down with a pint of good ale—very different from the stuff one is served with today. When I had finished my meal the landlady brought me half a pint of “sherry wine” to “keep off a chill”. I was only sixteen, but I manfully deposited this also in the correct receptacle. I then pulled up an armchair before the fire and felt that I should not require anything further to eat for several days.

When I awoke the rain had stopped, so I paid the reckoning (which probably did not exceed two shillings), kissed the pretty little maid, mounted my road racer, and departed. But I don't think I rode very fast after that meal and I expect the bicycle wobbled a bit. Later in the day I arrived at a little beerhouse in a desolate spot which seemed to be plumb in the middle of Dartmoor. It was called Warren House and a more uninviting place I had never stayed at before, having previously led a somewhat sheltered life. I could not foresee that there would be many days, and nights, in years to come when such a house, with walls and roof intact, would seem to me the height of luxury! The landlord, having looked me up and down, scrutinised my throat, appar-

ently so that he would know exactly where to cut, and the landlady seemed to be wondering how much money I had on me and what my clothes and shoes would be worth. I felt very lonely and far from aid. . . . Actually, they were excellent folk, and they fed me well. I stayed the night, a daughter giving up her room to me, and in the morning my throat was intact and the money in my trouser pocket ditto. Next day the sun shone and I netted *Argynnis aglaia*, fresh and frisky, as they flew about the old workings of the long-abandoned Vitifer tin mines. Again I doubt if my reckoning, which included a vast breakfast, amounted to more than a shilling or two.

Fifty-one years later I came to the Warren House once more and found that except for an outhouse or two it looked very much as it did at the time of my first visit. But the road was now a motor road, and the little beerhouse probably sold more liquor in a week than it formerly did in a month, at least in summertime. While I was renewing acquaintance with it my wife found four full-grown larvae of *Anarta myrtilli* on the ling overhanging a bank at the side of the road. I should never have found them in a month of Sundays, so perfect was their procrypsis.

Next day I bicycled to Dartmouth and found *Melanargia galathea* flying everywhere. I had never caught this butterfly before, so I made hay while the sun shone. Then I turned back coastwise and was beset by *galathea* all the way to Bridport. In a narrow hillside lane above Dawlish a brilliant tigermoth was cavorting in the hot sunshine. I recognised "hera" as we then called it; for in the early 'nineties the magazines had had a good deal to say about *Euplagia quadripunctaria*. But by the time my net was ready the insect had disappeared in a cottage garden and although I lent over the hedge and watched for some time it did not reappear. Shortly afterwards another, with yellow wings, flew across the lane. I potted about all afternoon but did not see any more.

At the top of the hill into Charmouth a man asked me if I had seen a lion, as one had escaped from a travelling circus the previous night. As I was armed only with a butterfly-net I took the hill in top gear and let the road racer race. The initial note of a donkey braying on the other side of the hedge caused my legs to revolve almost as fast as the spokes of the bicycle. At Lulworth Cove I lay face downwards on the grass near the top of the chuff while little brown butterflies flew about me in plenty. But I was chary of harming the colony, so took only six and felt guilty at that.

Thence I made my way to Salisbury, and on the hills named Dean, Pepper-box, and Whiteparish *L. coridon* and *Hesperia comma* were abundant and in perfect condition. I knew nothing about aberrations in those days so took about half a dozen of both sexes of each species, all of them as normal as could be. Indeed I think I should probably have discarded an aberration as being an imperfect specimen. At Streatley-on-Thames I found that the colony of *Lysandra bellargus* which I had discovered there a few years previously was still flourishing, with *H. comma* and *L. coridon* all about the chalk hills on both sides of the river. So far as I remember it did not rain again after I left Moreton Hampstead.

Those were happy days and perhaps even happier in retrospect. *O mihi praeteritos referat si Jupiter annos!*

Current Notes

A Clavicorn beetle new to Britain, *Ostoma ferrugineum* Linn., is recorded in *Ent. mon. Mag.* (89: 251). Two specimens were taken on 18th May 1952 by Mr. A. M. Robertson under bark of Scots pine at Linn O' Dee, Braemar, Aberdeenshire. It is common on the Continent and extends across Siberia into North America. Length 7-10 mm. Mr. R. W. Lloyd, reporting this capture, states that it is probably a fungus feeder and that Reitter (1911, *Faun. Germ. Käfer*, 3: 9), whose description he quotes, records it from old floor boards in dwelling-houses.

Colonel F. C. Fraser reports (*Ent. mon. Mag.*, 89: 258) a *Dasychira fuscelina* larva feeding on the spear plume thistle, *Cirsium vulgare* (*Oniscus lanceolatus* L.) at Bournemouth. It was in its last instar. "It had consumed part of the leaf and there was frass beneath. However, as the food-plant is quite unusual, I took the larva home together with some of the thistle leaves in order to avoid error. One hour later I observed that it was feeding voraciously on the thistle. I have not been able to find *Carduus* listed as a food-plant for this species; in the Bournemouth area it is occasionally found on *Erica*, but almost exclusively on some species of *Salix*. The larva subsequently pupated and a fine female emerged on July 22nd, 1953."

One does not expect a London daily newspaper to have an entomologist on its staff, so the occasional lapse in a paragraph of "popular entomology" can be forgiven. The following, which appeared in *The Daily Telegraph* on 6th July last, is at least comprehensible:—"When I walked from Moorgate to various points in and near Cheapside, and thus across large bombed areas, sadness has been relieved by noticing the country flowers, clover, campion and bracken which have added themselves to the usual ragwort and willow-herb. Now we are beginning to see several bright butterflies and moths, which we do not see in our semi-rural gardens. I have had accounts of some, and the other day saw some small bright scarlet ones, which seem to me to be the moth produced by a woolly bear caterpillar which feeds on ragwort." But what are we to say to a piece of "news" printed in the same newspaper on 12th October?—"African butterfly in Sweden. A giant African butterfly, the oleander swarmer, with a $4\frac{1}{2}$ in. wing-span, caught near Gothenberg, Sweden, is believed to have flown from the Equator". This kind of thing is not "news"; it is merely stupid. To translate "Oleander-Schwärmer" correctly should not be beyond the capacity of a newspaper man.

Some time ago the Ministry of Agriculture and Fisheries appointed a committee to investigate the use of toxic chemicals in agriculture. This committee has now been asked by the Ministry to extend the range of its investigations to a survey of the risks to wild life by the chemicals employed. The terms of reference are: "To investigate the possible risks to the natural flora and fauna of the countryside from the use in agriculture of toxic substances, including the possible harmful effects for agriculture and fisheries, and to make recommendations". However, it is one thing for a committee to make recommendations and quite an-

other to ensure that the recommendations are carried out. Meanwhile the indiscriminate spraying of our foodstuffs continues, to the probable detriment of ourselves and the certain detriment of innocuous insects.

At a recent meeting of the R. Ent. Soc., Mr. A. E. Gardner showed male and female imagines of the dragonfly *Aeshna isosceles* Müll. which had been taken at Potter Heigham in Norfolk on 27th June 1952. A mature larva of the species, which was dredged up in weed from a dyke at the same place on 30th May this year (1953), was also shown. This is the first larva to be found in this country. It was described as 20 mm. in length, dark brown in colour, with the first three abdominal somites yellowish. The insect reached maturity on 26th September. From a few eggs laid on 30th June 1952 larvae emerged on 5th August 1953.

In a paper on the time of appearance of *Erebia ligea* (the Arran Brown of our books) in Belgium by J. Hackray, printed in *Lambillionea* of 25th April 1953, the interesting fact is brought out that in the valley of the Helle *ligea* appears only in *uneven* numbered years. "In each expedition [to this valley] which I made in uneven numbered years", says this writer, "I always met with *ligea*. On the other hand, in spite of special and prolonged searches I never saw a single specimen in an *even* year." But in other valleys which descend from the same plateau *ligea* occurs in both even and uneven years. Altitudes, climates and terrain are the same in all these valleys. A critical examination of specimens from these localities has not revealed any relevant morphological differences; they all belong to the race *carthusianorum*.

The writer goes on to say that the development of *ligea* is slow and that two years are probably required for attaining the adult stage; indeed its biennial appearance in the Helle valley makes this probable, and it is unlikely that the life cycle is otherwise in the other valleys. Hackray therefore suggests tentatively that during a more or less recent period the *ligea* in most of the valleys have been influenced by particular meteorological conditions which, by accelerating the development of a certain portion of larvae, have initiated the appearance of a corresponding proportion of imagines in the following year. At Helle it is not impossible, he suggests, that the 'forward' individuals, being perhaps far less numerous, have not yet brought about the result observed elsewhere.

An interesting footnote in this paper, which seems to bear out Hackray's suggestion, is to the effect that in certain localities in Germany and Switzerland *ligea* appears only in *uneven* years. Moreover a Czech entomological journal (*Casopis Československe Spolecnosti Entomologicke*, xlv, 1947, Nos. 3-4, pp. 102-109) records that in the Tatra Mountains at an altitude of 700-1,400 metres *ligea* is met with also only in uneven numbered years. Perhaps some of our readers who have taken *ligea* in various localities from Scandinavia to the Caucasus will send us their observations of this butterfly.

An addition to the Hope Department at Oxford are some specimens of *Nonagria algae* Esper (*cannae* Ochs.) from western Ireland, taken recently. They are very richly coloured and strongly marked.

The current issue (October) of *The Entomologist's Gazette* contains "An Original Account of Rearing *Luceria virens* Linn." by Mr. G. Haggett, with excellent photographs of the larva; also a paper by Mr. E. A. J. Duffey on a new pest of real economic importance, now breeding out of doors in timber yards in this country, the Cerambycid beetle *Trinophylum cribratum* Bates. This beetle is a native of India, and the photographs which illustrate Mr. Duffey's paper show the damage caused by it to stacked timber. There are also illustrations of the larva and imago.

Notes on Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

When at Dr. Cockayne's suggestion I began this series it was intended to take the form of somewhat expanded "Practical Hints" for each month. So far I have roughly kept to this plan; but it is obvious that after two years, these Notes for the winter and early spring must become very scanty or largely repetitive. I propose, therefore, at these times to take up one or two problems that interest me in the hope they will interest readers of the *Record* also.

Perinephela lancealis Schiff. This Pyralid is said in all the books to feed on *Eupatorium cannabinum*. In most of the places where I have taken *lancealis*, however, this plant is absent. In Kent and Essex the plant is by no means common, whilst *lancealis* is found in almost every old wood. *P. lancealis* is certainly common enough in the overgrown lanes in the Isle of Wight where hemp agrimony grows, but I have never seen it at Kingsdown near Deal where there are the largest beds of *E. cannabinum* I know in Kent, and in the Southend area, where the moth is locally common, the plant is confined to one road in the Shopland area and here the moth is not found.

I suspect *lancealis* of feeding on several species of *Stachys*. At one time I thought it fed on *S. betonica*, but I have now found it where *betonica* also does not grow and fancy the food will prove to be the common *S. sylvatica*, which is always abundant in its localities. Perhaps a search in early September might solve this problem, though the full-fed larva unfortunately does not pupate till the following spring. Obtaining eggs and rearing the emergent larvae would, I fear, be of little value as many Pyralids take readily to substitute food-plants.

Adoxophyes orana v. Roessl. This imported pest seems to be spreading quickly and has arrived in Essex. Mr. Jacobs (*Ent. Rec.*, 64: 86) has already recorded its arrival as far west in Kent as Bromley; but it has now succeeded in crossing the estuary. On 16th June last I took a male in my m.v. trap in the garden here, and in late September the second brood has been comparatively common, up to half a dozen (all males) arriving on most evenings. I have no fruit trees in the garden, but there is a good sized orchard of old apple-trees about fifty yards away. This week I found time to ask the proprietor if I might look at the apples he was picking and a fair number bore the characteristic disfigurement of second brood *orana* larvae. The larva does not bore into the fruit to eat the seeds, as with *pomonella*, but eats a groove in

the rind of the apple; usually of a more or less circular character. The base around the stalk is a favourite place for this surface gallery, in which the greenish-yellow larva, of the usual *Cucoecia* type, may be discovered.

I think the moth is probably spread as a larva in picked fruit or else in the fruit baskets, as although with a favourable wind it could no doubt cross the estuary, the female appears to be very sluggish and I have not yet taken a single example in the trap. The ease with which pests are spread by equipment was brought home to me over thirty years ago. As is well known, *L. funebrana* Treits. is very difficult to get as a perfect insect, although so common as a larva, as it is seldom reared successfully and the moth's habits are obscure. When I lived at Sittingbourne a local fruit-grower bought an old army hut with glazed windows, in which to store his market baskets, and in June I took a large number of *funebrana* on the windows, which had emerged from larvae which had spun in the wicker whilst the plums were in transit the previous summer. It seems clear therefore that any pest emerging after the baskets had begun duty again might be scattered over a very wide area of country by lorry and railway. Such a means of transport is readily overlooked as in the ordinary course the baskets are stored in more or less open sheds and the moths would escape at once without being noticed.

I shall be glad if others will kindly report in the *Record* any *orana* taken outside Kent.

Notes and Observations

DISTRIBUTION OF DEILEPHILA ELPENOR LINN.—I am interested in the distribution of *Deilephila elpenor* Linn. and recently I have been informed that it is absent from Braintree, Bournemouth, and Portsmouth. I am unable to check up on this, but I should very much like to know if it is true. Are there any users of m.v. light traps in these areas who keep records of their captures? I should imagine that the species is quite abundant in all those towns, since it seems to flourish in any kind of habitat, except perhaps high moorlands. This year it seems to have returned to its pre-war degree of scarcity in this area. Intensive searching has yielded only 24 larvae (of which none was of the green form in the final instar); the last one was found on 17th October still only half grown; the first full grown one was found in the same field on 12th August and it pupated on 14th August. This variability in habit seems noteworthy.—J. H. JOHNSON, 1 Berry Street, Hepthorne Lane, Chesterfield, Derbyshire. 19.x.53.

LARVAE OF LIMENITIS CAMILLA L. AFFECTED BY PARASITES.—I was very interested in Major Collier's remarks in the May issue (*Ent. Rec.*, 65: 145) concerning his experiences in rearing the larvae of *L. camilla*, and I am grateful to Dr. G. V. Bull and others who kindly wrote to me privately on the same subject. It certainly appears that *L. camilla* is a frequent victim of insect parasites, especially *Apanteles glomeratus* L. If, as mentioned by Major Collier, parasites of the genus *Meteorus* are also turning their attention to the larvae of this butterfly, it may easily lead to a rapid decline in the number of White Admirals. On 10th April

this year (1953) I made an intensive search in the previously mentioned Huntingdonshire locality for larvae of *L. camilla*, but I was only able to find three examples, all of which were still in hibernation. The weather was cool at the time, and the larvae showed no outward sign of life for another week. They subsequently fed in a sluggish manner, never exhibiting much relish for the honeysuckle, and although each of them reached the final instar, all three proved to be victims of *Apanteles* attacks. I was unable to visit the wood in question during the time when *L. camilla* was flying, but I fear that the species is seriously declining in the locality. It first appeared there only a few years ago, and never has secured a really good hold.—GEORGE E. HYDE, 20 Woodhouse Road, Doncaster, Yorks. 16.x.53.

PLUSIA NI HÜB. IN GLOUCESTERSHIRE.—A male of this species came to m.v. light in my garden at Hardwicke on 12th August 1953. I am told this is the first record for the county.—R. P. DEMUTH, Hardwicke, Gloucester.

LEUCANIA FAVICOLOR BARRETT IN HAMPSHIRE.—A specimen of *Leucania favicolor* Barr. was taken in my m.v. light trap on 8th July 1953. It has recently been identified by Dr. H. King.—B. C. BARTON, Castle Mead, Highcliffe, Christchurch, Hants. 13.xi.53.

BUTTERFLIES AND BIRDS.—A few days ago I watched a pied wagtail make several unsuccessful attempts to take an *Aglaïs urticae* on the wing. The butterfly appeared to dally with the bird and after some undulating flights, which covered about twenty-five yards, the bird gave up the attempt and the insect settled on some michaelmas daisies.—C. M. R. PITMAN, Malvern, Southampton Road, Clarendon, Wilts. 13.x.53.

ORIA MUSCULOSA HÜB. IN SURREY.—On 6th August 1953 I took a worn specimen of *Oria musculosa* in my m.v. light trap at Weybridge, Surrey.—J. L. MESSENGER, Oakhill, Oatlands Drive, Weybridge, Surrey. 19.x.53.

COLOURATION OF PIERIS NAPI LINN. PUPAE.—On 31st July this year I obtained a female *P. napi*, which laid a number of eggs on hedge garlic. These duly produced larvae which all pupated between 19th and 21st August. Several of the pupae were yellowish or buff, whilst the remainder were green. From the yellowish coloured pupae perfect insects emerged on 3rd, 4th and 5th September. The green pupae, however, have, up to date, not produced any imagines. All the pupae were kept under identical conditions. I am rather interested to know whether it is chance or not that all the yellowish pupae have produced butterflies already, whilst the green ones have not.—W. MORRIS, 66 Wells Road, Penn, Wolverhampton. 19.x.53.

INCIDENCE OF BISTON BETULARIA LINN. AB. CARBONARIA JORDAN.—Between 7th June and 26th July, 1953, I took 46 *Biston betularia* ab. *carbonaria* in my light trap and only 1 of the normal grey form. It is the first normal *betularia* that I have taken here. It is a male. I attempted to mate it with several bred females but failed.—J. H. JOHNSON, 1 Berry Street, Hephthorne Lane, Chesterfield. 7.xi.53.

LATE DATE FOR *OPISTHOGRAPTIS LUTEOLATA* L. (*CRATAEGATA* L.).—On 12th October last I took a fine large female 'Brimstone Moth' (*O. luteolata*) at my m.v. light. It seems a very late date for this species.—C. M. R. PITMAN, Malvern, Southampton Road, Clarendon, Salisbury, Wilts. 13.x.53.

EARLIEST DATE OF OCCURRENCE IN ENGLAND OF THE MELANIC FORM OF *TETHEA OCULARIS* L.—With reference to the earliest date of occurrence of *Tethea ocularis* L. in its melanic form, mentioned by Dr. Cockayne in his note on page 278 of the October number (*Ent. Rec.*, 65: 278), my brother, G. B. Kershaw, took a completely black *ocularis*, with very prominent "XO" or "YO" discal mark, in South Devon in the spring of 1902. I do not know the exact date or place but it was almost certainly the Lynton Valley, as G.B.K. spent his holiday there and seldom altered his "S" Devon printed labels for any part of Devon. Incidentally, the reniform and orbicular stigmata are white in this G.B.K. aberration, which is now in my collection.—S. H. KERSHAW, Alderman's Place, Aspley Heath, Bletchley, Bucks. 17.x.53.

DAPHNIS NERII LINN. IN SOUTH YORKSHIRE.—A female of this species was caught in Doncaster on the 19th September. It was found on a pavement near the centre of the town, and was subsequently taken to the local museum. The moth was in worn condition, and was unfortunately killed before I heard about its capture. It is a pity that no attempt was made to obtain ova.—GEORGE E. HYDE, 20 Woodhouse Road, Doncaster, Yorks. 16.x.53.

DAPHNIS NERII LINN. IN EAST YORKSHIRE.—I have to report the capture of an Oleander Hawkmoth at Bridlington, on the Yorkshire coast just south of Flamborough Head. It was taken by a Mr. Scholes and brought to the Hull Museum for identification. The captor found it on the lid of a dustbin about midday on 27th October. I had the task of setting the specimen, which was still alive when brought to me—a pleasure which seldom comes to the English entomologist. During the previous night there had been a strong westerly gale which died away early the following morning, and the 27th was sunny and calm. Bridlington is sheltered from the north by Flamborough Head.—D. WADE, 17 Waldegrave Avenue, Hull. 14.xi.53.

"MASKELS".—The name 'maskel' for the larvae of the White butterflies which Dr. E. Barton White suggests in his article (*Ent. Rec.*, 65: 284) has not previously occurred in print, is recorded at some length in the *English Dialect Dictionary* from Somerset and Devon. It is quoted in various spellings as well as the usual one of 'maskel'—mascel, maskell, mahlscrawl, mal-scral, maltscale, marly-scrarly, mascale, maskill, maul-scrawl, muskel, all in Devon, and as maul-scrawl in Somerset also. It is applied also to a small shrivelled apple in W. Somerset.

Bullfinches, which, Dr. Barton White suggests, are not entirely insectivorous, are in fact bud, seed, and berry eaters; it is their young that are fed on the larvae of Lepidoptera, and on Coleoptera and Diptera ("Handbook"). They are by far the most destructive of their family to the fruit-grower.—A. W. BOYD, Frandley House, Nr. Northwich, Cheshire. 18.x.53.

SPHINX LIGUSTRI L. IN NORTHAMPTONSHIRE.—I can add some evidence to Mr. Gent's note in the June issue (*Ent. Rec.*, 65: 181) postulating the establishment of *Sphinx ligustri* L. in Northamptonshire. In June 1907 I took a pair *in cop.* on the gates of Wellingborough School and bred successfully from the pairing. I think, however, that Northants must be the fringe area as I have worked two light traps, one here and one near Market Harborough, during the last two years without seeing it, the distance from Wellingborough being only about seventeen miles. —HERBERT A. BUCKLER, Sutton Bassett, Market Harborough. 17.xi.53.

DICYCLA OO L. AT WOKING.—On 24th June, 1953, a specimen of this insect appeared at my m.v. trap here for the first time and another example the next night, but not a single one more in spite of the most favourable conditions. Mr. Bretherton, who lives barely three miles distant at Ottershaw, took the species almost nightly from this date till the third week in July. Oaks are as prevalent here as there. This area seems to be on the fringe of its range.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking. 28.x.53.

MIGRATION OF NONAGRIA DISSOLUTA TREITS.—With reference to Mr. Goodson's note in the October number of the *Record* (65: 291) headed "A Migration of *Nonagria dissoluta*", a specimen came to the m.v. light trap in my garden on the night of 5th-6th August. Like Mr. Goodson's it is noticeably larger than my Hampshire specimens. I know of no large reed-bed for many miles, but there are reedy ditches where it could have bred. The fact that the species is not recorded in the local list (*Lepidoptera of Haslemere and District*, 1951) and that this has been the one and only example of the species that has been found in three years of m.v. trapping suggest that it is probably a vagrant or migrant.

The following night one *Leucania straminea* Treits. came to the trap, again a species not recorded in the local list or previously seen by me here.

Undoubted migrants in the trap were a *Plusia ni* Hübn. on the night of 12th-13th August, and a *Herse convolvuli* Linn. on the night of 8th-9th September.

An odd find was an *Earias clorana* Linn. on the 2nd-3rd August. The species is not recorded in the local list, nor have I seen it here previously. Why one of the comparatively rare second brood should appear in the trap is mystifying. Are there any migration records of the species?—R. M. MERE, Mill House, Chiddingfold, Surrey. 31.x.53.

CORRECTION.—In the 9th paragraph of my paper "The Discovery of Wild Larvae of *Thalera fimbrialis*" in the November issue, page 306. the last sentence should read: "Dr. Cockayne states that 'the yarrow sometimes shows signs of the presence of a larva by the last inch or more being partially cut through so that it hangs down slightly withered'. I did not find this state of affairs, however, in the wild".—H. B. D. KETTLEWELL, University of Cape Town, Zoology Department, Rondebosch, South Africa.

SALE CATALOGUES.—As I am working on the history of collecting Lepidoptera in England, with the lives and captures of some of the

early nineteenth century collectors, I should be grateful for any copies or bundles of old sale catalogues for which their present owners have no further use.—P. B. M. ALLAN, 4 Windhill, Bishop's Stortford, Herts.

SYMPETRUM FLAVEOLUM L. AT SANDOWN.—I should like to record the capture of a specimen of this dragonfly at Sandown (Deal Sandhills) on the 29th June. It was shown to Mr. G. H. Youden, who later told me he took another in his moth-trap at Dover the following night.—S. WAKELY, 26 Finsen Road, Ruskin Park, London, S.E.5.

A RECORD OF MECOSTETHUS GROSSUS (L.).—In my recent "Some Notes on Orthoptera and Dermaptera in the West Midlands" (*Ent. Rec.*, 65: 151) I referred to a record of *Mecostethus grossus* by Elton from Whixall Moss, Shropshire. This is incorrect and I am indebted to Mr. D. K. McE. Kevan for pointing this out to me.—F. FINCHER, Randan Wood, Bromsgrove. 11.xi.53.

COLEOPTERA

CRIOCEPHALUS FERUS MULSANT (POLONICUS MOTSCHULSKY) IN THE ISLE OF WIGHT.—Under the heading "Fifty Years Ago" in the July-August number of the *Record* (p. 238) there is an interesting note of the first discovery of this longicorn in Britain, when it was found in the New Forest. As far as I know there have been no records of this beetle for the Isle of Wight, and I should like to record the capture of a fine specimen at Osborne on 12th August this year. It was taken by Mr. J. Lobb, who was kind enough to send me the specimen.—S. WAKELY, 26 Finsen Road, Ruskin Park, London, S.E.5.

DIPTERA

VOLUCELLA ZONARIA PODA IN MIDDLESEX AND HERTFORDSHIRE.—At the suggestion of Mr. L. Parmenter I am sending you my records of *Volucella zonaria* Poda. During a conversation recently he mentioned that you had received a note of this fly being found in Middlesex this year. I was under the impression that it had been recorded in this county during 1950 when the B.M. had quite a number of specimens from the general public. All the specimens I have taken so far have been females. The records are as follows:—

- 15.viii.50. Harrow, Middx. In garden on flower of *Rubus fruticosus*.
- 21.vii .51. Batchworth Heath, Herts. On leaf of *Rubus fruticosus*.
- 16.viii.52. Batchworth Heath, Herts. On flower of *Scabiosa Succisa*.
- 27.viii.52. Harrow, Middx. On flower of *Solidago Virgaurea*.
- 5.vii .53. North Harrow, Middx. On flower of *Solidago Virgaurea*.
- 13.ix .53. Batchworth Heath, Herts. On flower of *Scabiosa Succisa*.

The Hertfordshire specimens were taken about 100 yards from the Middlesex boundary, this being the road from Batchworth Heath to Harefield.—B. L. J. BYERLEY, 48 Elmgrove Road, Harrow, Middx. 21.x.53.

Fifty Years Ago

(From *The Entomologist's Record* of 1903).

ROOSTING ATTITUDE OF *VANESSA CARDUI* L.—In the afternoon I paid a visit to Dulwich Park, where I found them [*Vanessa cardui*] extremely abundant. . . . It being late in the afternoon, I sat down on a seat to watch them, and was presently rewarded by seeing them one by one fly up to roost in a small laburnum tree. I marked one or two down, and found that they generally roosted upside down, on the underside of a leaf, with the antennae slightly expanded.—C. W. COLTHRUP.

COCOONS OF THE BURNET MOTHS.—*Anthrocera trifolii* was just appearing and in very fresh condition. Not being able to secure a series of imagines, a hunt for cocoons and larvae was made. A large number of Anthrocerid cocoons were found, but they did not produce *A. trifolii* but *A. filipendulae*, and very few of these, as almost every cocoon contained dipterous parasites, while one produced a good-sized ichneumon. The finding of these cocoons has revealed an interesting fact. Nearly all of them were found low down in the tufts of grass (*Poa* sp.) near their foodplant, and, from the fact that they were low down, the erroneous impression was formed that they were very probably *A. trifolii*, which usually has this habit. From the results obtained it appears as if larvae that are stung spin up low down, while healthy larvae usually come well up the stem to pupate. Many cocoons were dark-coloured, a fact that suggested that their contents were not healthy pupae, but some of the cocoons were quite healthy and yellow-looking, yet these also, except in two instances, produced parasites.—W. J. KAYE.

ABUNDANCE OF APATURIDS NEAR LAUSANNE.—On July 20th, in a little wood near Lausanne, I made what I should think to be a record catch of Apaturids in one long morning's work. I netted in all 70 *Apatura iris*, 42 *A. ilia*, and 17 *A. ab. clytie*, in decent condition, and I must have thrown away about as many chipped ones. In addition, I took what I am given to understand is a great rarity here, five *A. ab. iole* and seven transitions. These, with two *Limenitis populi*, ♀s, and a number of *L. sibilla*, and our commoner Argynnyds . . . completely loaded me, and I returned without trying what the afternoon hunting might be worth.—P. A. H. MUSCHAMP.

HABITS OF *SCIAPHILA PENZIANA* [*CNEPHASIA BELLANA* CURT.].—I should be much obliged for exact details as to the foodplants of the larva of *Sciaphila penziana*, and the time of year at which I could find the larvae, as I should like to try to breed it. It is fairly numerous in its very restricted locality here, and on one evening last August I found over 20. I had an idea that the larvae fed on lichen growing on rocks, but I find all the newest specimens on stones on the slopes below the rocks, and about the end of their time of appearance, when they are getting worn, they are mostly found on the rocks at all heights. I found one example drying its wings, the nearest vegetation to which was a dark rough moss and the little mountain *Galium*—no lichen at all—whilst I found a pupa-skin within three inches in a little tuft of moss.—H. A. BEADLE, Keswick.

Current Literature

OBSERVATIONS ON THE DEVELOPMENTAL CYCLE OF THE PINE PROCESSIONARY MOTH (*THAUMETOPOEA PITYOCAMPA* SCHIFF.). By E. Biliotti, P. Grison and R. Silvestre de Sacy.

This paper, printed in *Bull. Soc. ent. Fr.*, LVIII, No. 2, pp. 30-32, brings out two interesting facts. Firstly that the duration of the pupal stage in *T. pityocampa* Schf. is longer in the extreme south of France at low altitudes than it is further north and in more elevated regions. Thus at Montpellier, about 7 miles from the Mediterranean and less than 50 feet above sea-level, the pupal stage lasts for $4\frac{1}{2}$ months, whereas at Sables d'Olonne, about 200 miles north of that town, the insects pass only $3\frac{1}{2}$ months as pupae. Secondly the larval development is retarded in maritime areas. This is clearly shown in a table compiled from observations on larvae collected during the first week of September in two areas on the Bay of Biscay, viz. Lacanau and Nantes (about 150 miles north of Lacanau), and in Angoulême, an inland area some 80 miles north-east of Lacanau and 60 miles from the coast:—

	1st St.	2nd St.	3rd St.	4th St.
Lacanau	2%	73%	25%	—
Nantes	—	75%	25%	—
Angoulême	—	4%	88%	8%

A week later differences of the same order were found in larvae collected in a semi-continental region and a maritime locality, namely in the Department of Sarthe and at Carnac on the coast of Lower Brittany:—

	1st St.	2nd St.	3rd St.	4th St.
Sarthe	—	5%	95%	—
Carnac	8%	68%	24%	—

There are five larval stadia (*T. processionea* has six) and the winter (November-February) is passed in the 4th stadium in the majority of the areas from which the writers obtained larvae. Hibernation is only partial, the larvae coming out of their webs to feed on mild days.

The influence of the plant-host on larval growth is discounted by the writers. Time-stadia records of the larvae have been identical for both *Pinus maritima* and *Pinus insignis*. At Caudos in the Landes *Pinus carai-bea* has been planted and the development of larvae fed on this tree is comparable with that shown by the insect when reared on pine and *P. maritima*.

With regard to altitude (the effect of which on the larval development was shown by Wilkinson in the case of *T. wilkinsoni*) larvae collected on 9th October in the Col du Vent on Le Larzac at an altitude of 770 metres were all in the 4th stadium, i.e. the normal hibernation stadium, and consequently they were very much more advanced than those in the neighbourhood of Montpellier, where egg-batches on pine-needles had been found so late as the first week of September. In the area of Angoulême during the period 18th to 20th October moultings from 4th to 5th stadium were observed, whereas at Caudos moults from 3rd to 4th stadium were still occurring (28% on St. III and 72% of

St. IV) whilst at Carnac during this period the larvae were yet another stadium behind (42% of St. II and 58% of St. III). It would seem therefore that climate plays some part in the developmental cycle of this species. But as to whether the climatic factors have a real, effective influence and if their fluctuations are capable of provoking each year local variations in the development cycle remains to be proved. Judging by their observations on rearings carried out at Versailles these writers are of opinion that these individual variations are likely to be less potent than the variations acquired by natural selection, which eventually result in the formation of ecotypes or ecological races.

P. B. M. A.

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS: COLEOPTERA
Published by the Royal Entomological Society of London. 1953

Vol. IV, Part 3: HYDRADEPHAGA. By F. Balfour-Browne. 33 pp., numerous figs. Price 6s.

Prof. Balfour-Browne's reputation as an authority on the Aquatic Coleoptera is sufficient guarantee of the high standard of this publication, which deals with our carnivorous water beetles (Haliplidae, Hygrobiidae, Dytiscidae, Gyrinidae). It is, as he points out, practically an abstract of his book *British Water Beetles* (2 vols., 1940, 1950), with certain mistakes corrected and some changes in the keys, that to *Hydroporus* being entirely new. The figures, in 44 groups, are all that could be wished for and the rather difficult and obscure characters that have sometimes had to be used to separate genera and species are thereby, as a rule, considerably clarified. That the keys are intended for the fairly advanced student, presumed to be already familiar with the general appearance of the main types, is evident from there being only few references to this feature and to size (e.g., in the Dytiscini—pp. 27-8) except where they happen to be used as key characters. To call *Hygrobia* a large insect (p. 9) might almost lead the novice to expect something on the scale of a *Dytiscus*. Specially commendable is the concise but comprehensive statement on habitat and British range under each species—except, by an oversight, for the Laccophilini. These, it may be remarked, are here widely separated from the Noterinae, being placed between the Hydroporini and Colymbetini—a position which, as the author implies, is open to dispute. In the first line of p. 3 the word 'Aquatic' has been accidentally omitted.

A. A. A.



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A specimen page can be sent on receipt of a stamped (14d) and addressed envelope.

EXCHANGES AND WANTS

Wanted.—I would be grateful for the loan of any photograph or coloured drawing of specimens of *Lysandra coridon* of the various forms of ab. *extrema* as illustrated and described in Bright & Leeds' Monograph of the Chalk Hill Blue Butterfly, pl. 10 and 18.—S. G. Castle Russell, 5 Bridge Road, Cranleigh, Surrey.

Wanted.—Volume LVI (1944) of *The Entomologist's Record* (unbound).—H. W. Andrews, Spring Cottage, Smugglers' Lane, Highcliffe, Christchurch, Hants.

Wanted.—Volume XV (1903) of *The Entomologist's Record*, in parts as issued. £1 offered.—F. W. Byers, 59 Gurney Court Road, St Albans, Herts.

Wanted.—We are still in need of copies of our issues of January, July/August, and December 1951. If any of our readers have spare copies for disposal we shall be glad to buy them back.—F. W. Byers, 59 Gurney Court Road, St. Albans, Herts.

Exchanges and Wants (continued from previous page)

Wanted, for experimental purposes, Pupae of *S. ocellatus*. I can offer ova of *T. aurago*, or set local Lepidoptera.—R. G. Todd, Wells, Norfolk.

Exchange.—Pupae of *N. zonaria*. Wanted.—Pupae of *L. sinapis* and *N. lucina*.—T. D. Fearnough, 13 Salisbury Road, Dronfield, nr. Sheffield.

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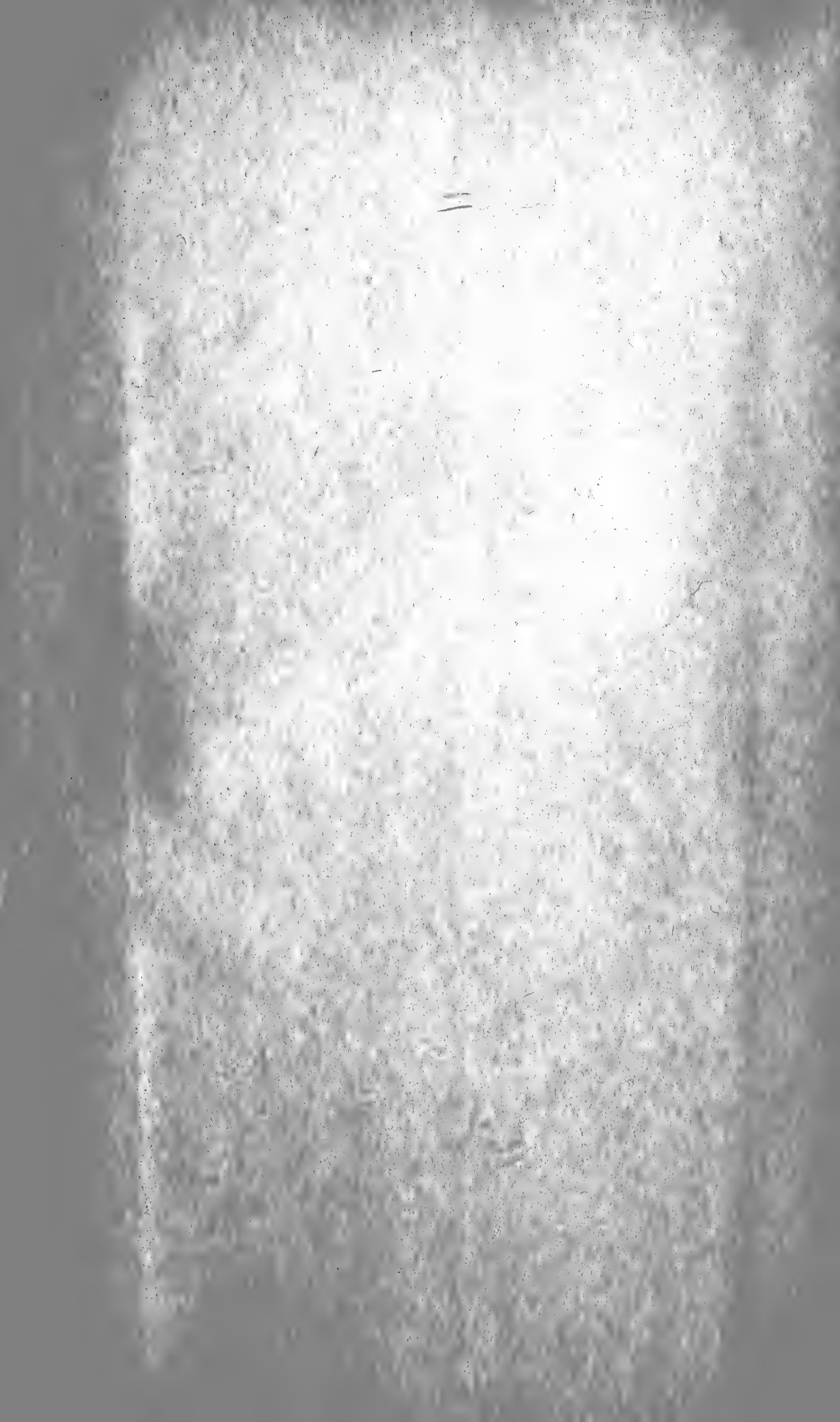
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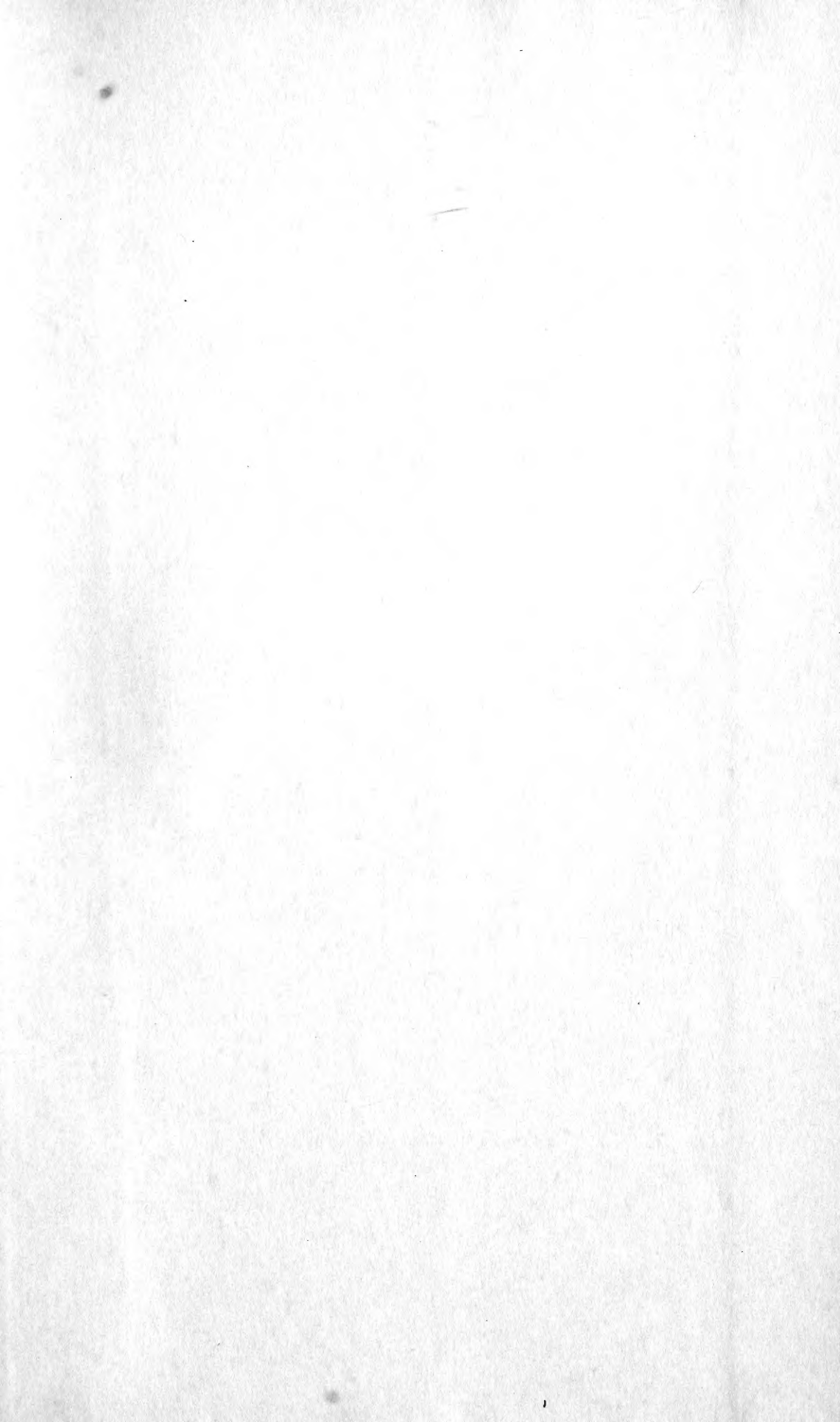
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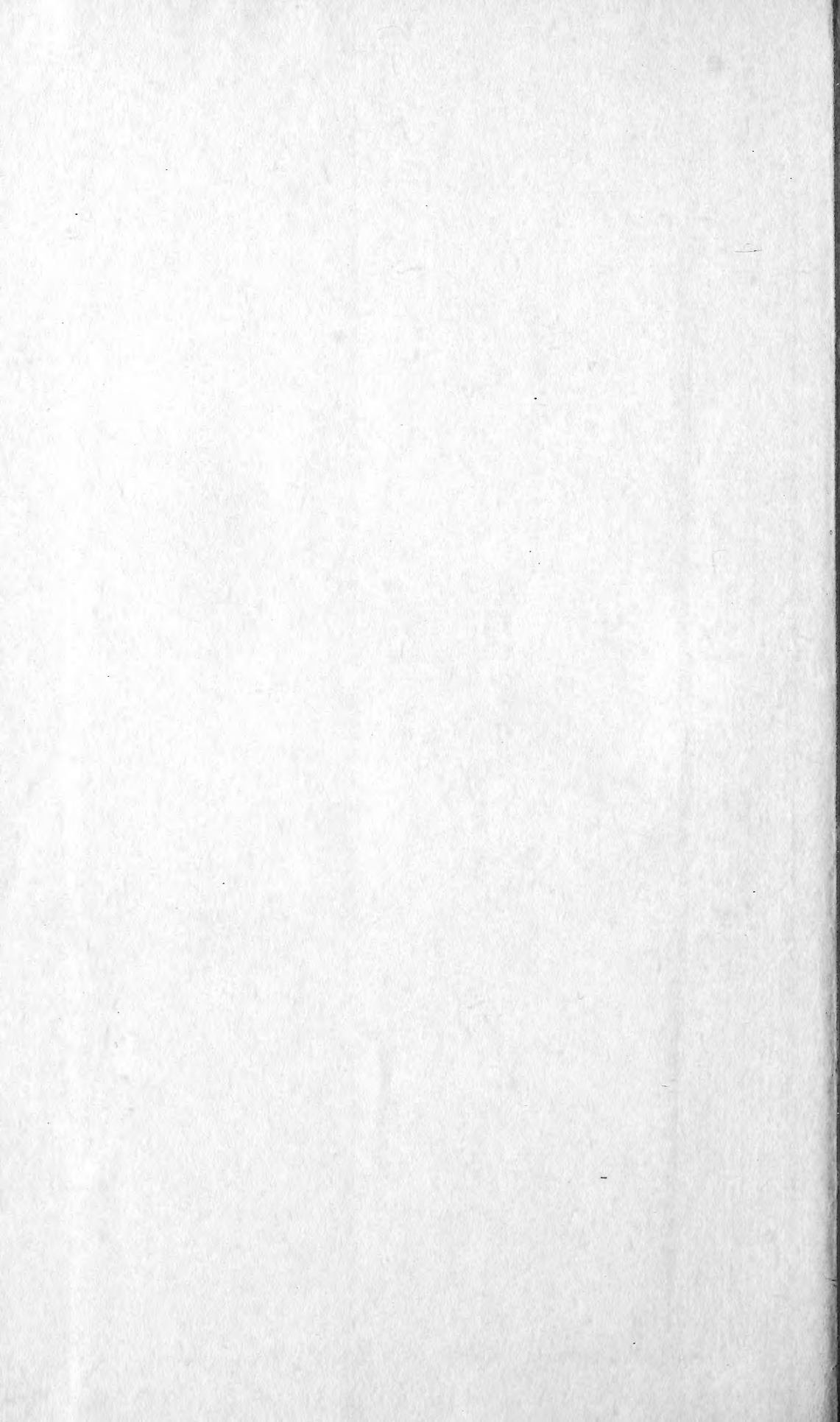
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